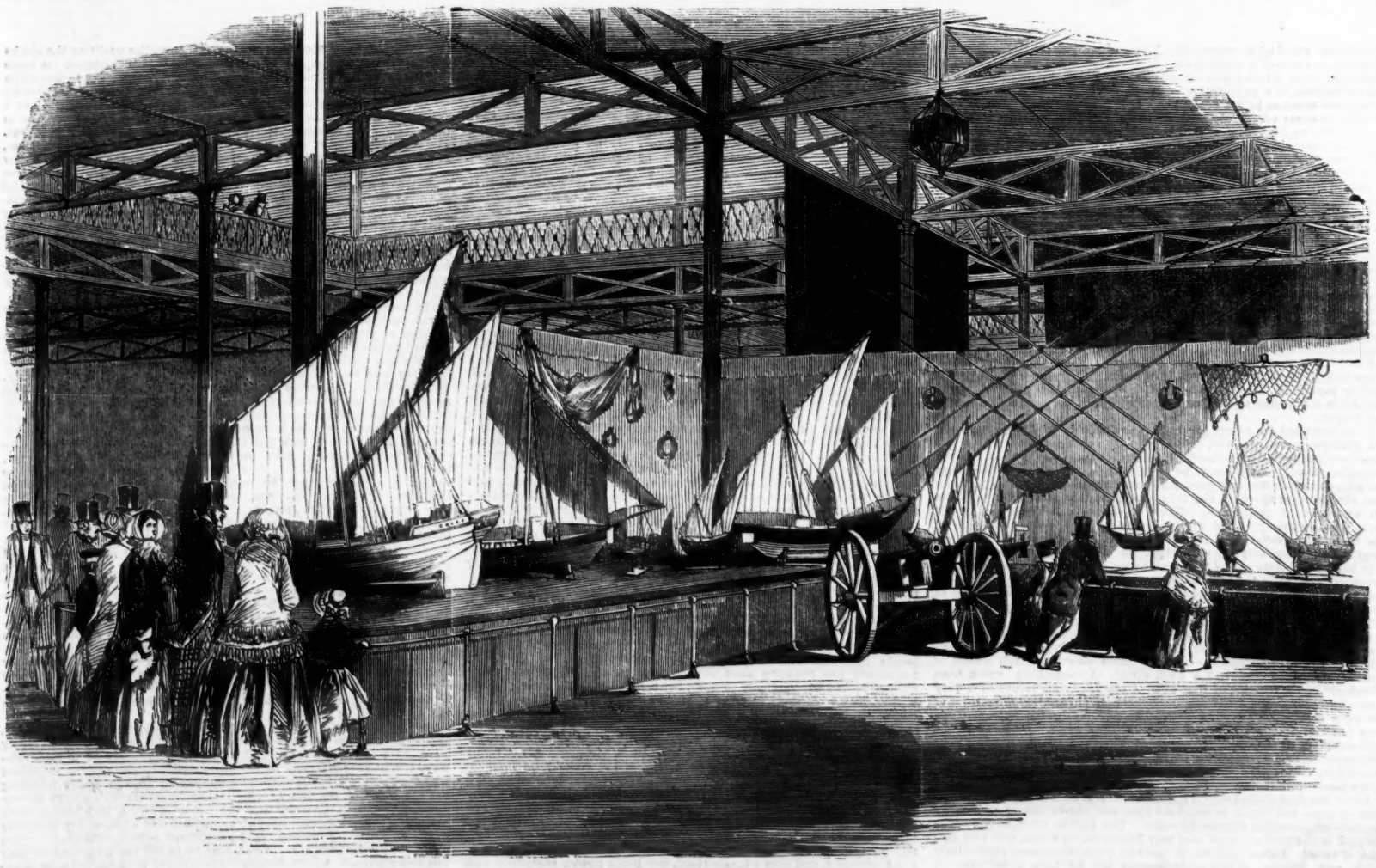
No. 492.—VOL. XVIII.] SATURDAY, JUNE 7, 1851. { TWO NUMBERS, 1s., WITH HALF-SHEET SUPPLEMENT GRATIS.

THE GREAT EXHIBITION.

NAVAL ARCHITECTURE.

THERE can, we apprehend, be little doubt in the opinion of all connected with, or interested in, naval art and the national science of ship-building, that Great Britain, in her maritime capacity, is not so fully or so adequately represented in the Exhibition as she ought to be. If there was any one department of industry—any one national pursuit to which, more than another, the place of honour, in all the meanings of the phrase, ought to have been assigned, it was surely that connected with our much boasted empire of the seas; we ought to have had a complete epitome of the naval architecture of the realm, and, if possible, also, a complete epiteme (both by means of models, of course) of the history of ship-building in England from the earliest times; we ought to have been able to trace our progress from the days of the curracle and the primitive galley, founded, perhaps, in a great measure, upon Roman models, to the last screw-propeller man-of-war launched from Woolwich or Plymouth, or the last crack yacht set afloat at Cowes. A few ancient models are certainly to be found in the Naval Gallery: we have a model of a Roman war-galley, with four banks of oars, very curious; and another of the famed ship of Henry VIII., which carried him to the conference of the Field of the Cloth of Gold; another of a first-rate, built in Charles I.'s time; and several of the not ancient, but old-fashioned, tubs in which Rodney and his sea-dogs won their battles. The collection is, however, but fragmentary: we have only scattered links of the chain which, if completed, would have formed one of the most interesting and purely national portions of the Exhibition. Surely Government had it in its power to do more than it has done. There is a fine, although by no means perfect, collection of models in Somerset House, to which the general public have no means of access; and there are, doubtless, many more such assemblages of miniature vessels of all ages, and all styles of architecture and rig, connected with our national ship-building establishments at the different arsenals. Surely, from all these a perfect array of specimens of our progressive skill might have been educed. We will answer for it that such a fleet would have attracted much and enlightened curiosity, and that it would have been esteemed a graceful tribute on the part of England to that constructive skill and marine intrepidity which, more than any other causes, have contributed to place her at the head of the list of nations. Or even if the formation of such a collection had been deemed inadvisable or impossible, surely we ought, at least, to have had a series of models of the different species of ships, and coasting and fishing craft, used in the present day round our own coasts. The interest of such a collection would have been the greater when we recollect that it frequently happens that the style of vessel used upon a certain range of coast reflects not only the geographical, and in some degree the atmospherical, conditions of the district, but also often indicates the peculiar descent, race, and blood of the people who inherit it. Thus, take the west coast of Britain, from the Highlands to Cornwall. The shore is in many parts mountainous — at least to a greater extent than the east coast. Squalls and sudden gusts of wind are the necessary consequence — a consequence which we see reflected in the construction of the western coasting craft, which are more generally schooner-rigged, and therefore provided with smaller and more manageable sails than the old-fashioned smack arrangement of spars and canvass, which long held good upon the east coast, and which disposed two-thirds of the sail a vessel carried in one huge and unwieldy web of cloth. Again, take the range of the eastern coast about Yorkshire and Lincolnshire, from the Humber to the Wash; the shore is remarkably flat, muddy, and sandy. The tide ebbs and flows over long expanses of slimy marsh. The land, in fact, reminds you of the Dutch and Belgian coast, in its far-expanding levels. It is evident that coasting craft employed along such a shore must be constructed so as to take the ground kindly, and lie when left by the tide without straining or injury. This is one of the principal peculiarities of the quaint Dutch and Flemish schuyts we often see in the river, and knocking about down Channel and in the North Sea; while, so steadily do the same causes produce the same effects, that an inexperienced eye might be pardoned for mistaking a Yorkshire billy-boy, laden with stones for the New Houses of Parliament, for a Dutch sloop bringing over a cargo of eels from the dams and sluices of that swampy land. One other illustration of contemporary naval architecture as showing national derivation. Upon the north-east coast of Scotland we have frequently watched the fleets of herring-boats assembled at the principal fishing stations in Sutherland and Caithness. Minor differences excepted, there were always to be seen two species of boat, differing in essentials the one from the other. The first of these classes consisted of short, very strongly built craft, of great breadth of beam, and still greater depth and hold of the water, the bow and stern almost perpendicular, each boat carrying a couple of lug sails, the larger spread upon the foremast, which is placed chock forward in the very bows. The mizen is a smaller and less important sail, but helps to counterbalance the broad canvass spread for'ard. The second class of boats, again, are much longer than the first. They have about equal breadth of beam, but are exceedingly shallow, with the bow and stern sloping at a blunt angle from the keel, and overhanging the water. They carry more sail than the first class of boats,



MODELS OF SHIPS AND BOATS.—INDIA.

the main sheet of canvass being always upon the after mast, and the fore-mast displaying no larger a sail than the mizen of the first described class. Now, these distinctions of build and rig are purely national. The short deep boats are manned by crews descended from the Scandinavian colonies, established all along the eastern coast of Scotland; the fishers who ply their trade in the long shallow boats are Celts to a man. In the first class of craft the language used is a strange *patois* of corrupted Norwegian and broad Scotch; on board the other set of boats it is invariably Gaelic. Let us add, that the descendants of the sea-kings entertain a profound contempt for their Erse-speaking brethren; and that a proverb popular amongst them is to the effect, that a highlandman will never go to sea so long as there is wind enough stirring to shake a dock-leaf.

We have, perhaps, said enough to give some idea of the peculiar investigations which might have been pursued, and the peculiar light which might have been thrown upon our national characteristics, had we been furnished at the Exhibition with a complete collection of specimens of our naval construction, illustrative of every coast and every race, and every theory of marine construction which is born of the coast and the race around us. No opportunity, however, being afforded for instituting a complete inquiry into this interesting subject, we proceed to describe the main feature of the collection which has actually been brought together.

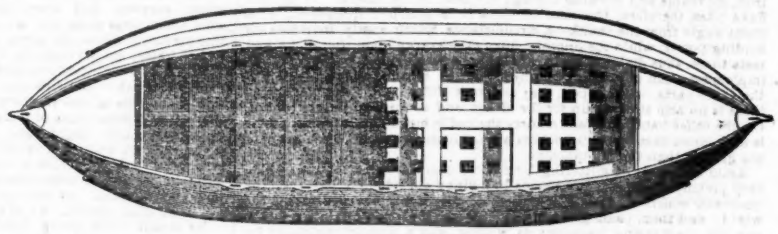
It consists, then, principally of models of ships of war, showing their lines; and, in a few cases, of section models, showing the dispositions between decks. Many of the former class of models are in what may be called *bas-relief*—that is, only one side of the vessel is represented, the object simply being to show her mould and run. These are arranged upon the western wall of the Exhibition, and are principally representations of vessels constructed in our naval dockyards within the last twenty years, many of them having been built during the long contest which agitated the naval world between the Surveyor of the Navy and his numerous antagonists and detractors. There are also a fair number of models of steam-boats—some screw and some paddle—some in relief and others entire. A large passenger-ship or two is exhibited, shewing some of the most recent improvements in interior arrangements; and, after glancing at a number of minor rigged models of schooners and cutters, introduced rather as specimens of the skilled neat-handedness of their builders, than as exemplifying any principles in naval architecture, we come upon a vast variety of plans and inventions for life-boats. The number of these indeed is curious. There must be between one and two hundred models of craft intended for saving life in cases of shipwreck. Every possible combination of cork and air-tight chambers, having been resorted to, to work out the notions of their inventors. We have given Illustrattons of two of these boats—Bateman's and Wenzel's. On the other side of the stall on which the life-boats make so conspicuous a figure, is arranged a great variety of models of ship machinery, particularly that connected with anchorage, such as capstans, windlasses, chains, and anchors themselves. We have then a number of compasses and graceful designs for binnacles; and, lastly, after inspecting an *omnium gatherum* of naval odds and ends, such as gun-harpoons for striking whales, and almost equally formidable weapons for shooting ducks from punts, models of oddly-shaped ships with sliding keels, and catamarans constructed out of spars of wood, and air-tight bags acting as buoys, we have an infinity of diving apparatus, illustrative of the entire process of adventuring, remaining, and working below water.

We will first briefly direct attention to the bas-relief models of the men-of-war. Had the set been complete, or had specimens of different ages been copiously given, the observation of the gradually shifting forms adopted in our dockyards would have been specially interesting. As it is, however, we can gather from the collection hints not without their meaning and significance. The first thing which strikes one in modern ship-building is the cutting down of the bulk which our ancestors were fond of rearing above the water. The castles, and quarter-decks, and poops with which they delighted to encumber their vessels, began first to give way at the bows; and the forecastle has long been a mere name, the thing having vanished more than a century ago. It was not, however, until a much more recent period that the mountains of timber piled up astern began to be reduced: and the naval battles in the latter third of the last century were fought by ships of the line with taffrails rising 40 and 60 feet above the water. The tendency of improved ship-building is now to lay the whole expanse of deck as nearly as possible upon the same level. A few smaller vessels, we believe, have been actually built flush from stem to stern; but, at all events, the modest height of the quarter-decks now constructed contrasts strangely with the old notion of the symmetry and propriety of a towering poop, ornamented with all the art of the carver, and furnished with range over range of quarter galleries. Beneath the water-mark the tendency of advancing ship-building has been so to adapt the curve of the swelling side and the concave portions of the ship, which, in nautical phrase, "take most hold of the water," so as to prevent, as much as possible, the heavy and injurious

BATEMAN'S LIFE-BOAT.

tendency to roll; and that the dimensions of the part of the ship diminish immediately before the rudder, called the run, and in which the convex form changes into a pure and finely modelled concave, so as to allow the body of water displaced to close quickly and easily, flinging its full force upon the helm—the spectator will observe that in modern ships this "run" is of larger dimensions than in the olden craft. An exception to this rule is, however, in some degree to be found in the vessels of the survey or of the navy. Take the *Queen* for example, a first-class man-of-war of 116 guns: a full model of her hull is exhibited, which, for bluffness, and, to modern eyes, clumsy ugliness of mould, could not be beaten by any of the ships which carried the flags of Byng or Rodney. The merits of the *Queen* have accordingly been long a fruitful theme of controversy in the naval world. Her best qualification is, we believe, that she carries her guns well out of the water; but she is slow, and rolls tremendously in a sea-way. In the lines shown of new frigates and gun brigs, it is curious to observe the approach to the style of building which has been long ago adopted in the construction of yachts—the bows sharper and finer than ever; the runs of great size, and delicacy of mould; and the height of the ship attaining its extreme point when measured from the taffrail to the lower extremity of the stern-post. The effect of this latter arrangement, taking into consideration that the ships in question are made to sit with the stern low in the water, is to cause them to draw many more feet of water aft than forward, to give them great steering power, and a strong firm hold of the water. The attention of the spectator may be profitably directed to the models of the *Pique* and the *Inconstant*, two of our heavy first-class frigates. Of these, the former seems the more graceful; but the latter has proved herself the most efficient vessel. Both the *Pique* and *Inconstant*, however, belong to the old school. Our first-class frigates are now rated to carry fifty guns, and beautiful specimens of these may be seen in the models of the lines of the *Raleigh* and the *Arrogant*—two of the noblest ships on the water, and bigger than Lord Nelson's old seventy-fours. The *Phaeton* and *Arethusa* are now at sea in the experimental squadron, being tried against each other. Both vessels are models of symmetry and grace.

After inspecting the new-fashioned men-of-war, furnished with auxiliary screw propellers, such as the *Hogue* and the *Agamemnon*—vessels carrying the most formidable batteries of cannon ever borne across the ocean, and no doubt destined to take a conspicuous part in our next naval war—if ever such a misfortune should arise—the visitor may advantageously study the moulds of the little squadron, if experimental gun-brigs, the evolutions of which excited so much interest some five or six years ago. There is no department of our naval architecture in which we have made more progress than in the construction of the small men-of-war, called gun-brigs. The old vessels of this class were a disgrace and a reproach to our dock-yards. Over-masted, deep-waisted, ill modelled, they went down or went ashore with such a regularity, that they acquired the significant nick-name of "coffins;" but were still—not much to the credit of successive governments—employed as packets, until the last of the fleet



WENZEL'S LIFE-BOAT

was either wrecked or worn out. Now-a-days, the gun-brigs form one of the most creditable departments of the navy. Here we see the models—and beautiful they are—of the fleet built both by private and official enterprise, the peaceful records of whose cruizes filled so many newspaper columns half a dozen years ago. The precise question of their merits was never very fairly settled; but the general opinion was, that the *Mutine*, the *Daring*, and the *Espiegle* were the flowers of the fleet. The *Mutine* afterwards greatly distinguished herself on the coast of Africa. The *Flying-Fish*, one of the quickest of the squadron, was so wet, as seriously to interfere with the comfort of all on board; but still, altogether, the vessels in question formed, perhaps, the most beautiful and best adapted squadron which ever went to sea.

A few, but only a few, models of merchant sailing-vessels are exhibited, To one of these the attention of the visitor is requested, as a perfect specimen of the latest improvements in first class passenger ships; we allude to the model of the hull of the *Owen Glendower*, one of Mr. Green's splendid fleet of frigate-like merchantmen, built at Blackwall. The capacity for stowage in this fine ship is beautifully combined with a faultless outward mould. Her bows are sharp, and have that slightly concave tendency which denotes speed and dryness, and the run is beautifully fine, and what sailors call "clean." In one respect the *Owen Glendower* differs from the new fashion of flush building, now so prevalent. *Caeteris Paribus*, in our opinion, a flush built ship is, for abstract sailing and weatherly purposes, superior to a higher piled vessel. She has less upper weigh to carry, consequently she will roll less. She exposes a smaller superficies of hull to the wind, consequently she will sail faster; and she is altogether lighter and more compact, consequently she will last longer.

Ships intended for passenger traffic, particularly for long voyages in hot latitudes, must, however, be designed with a view to other than the considerations which would make the quickest and and the most handily managed vessel. They must be comfortable, and commodious and healthy, as well as fast and good sea boats; and care must also be taken that the stowage space of the ship is not unduly interfered with by the demands of passengers. These were the considerations, in all probability, which presided at the designing of the *Owen Glendower*. She carries a quarter-deck not too high, but of more than ordinary length, and sufficiently lofty to allow an airy and comfortable cabin, with berths and state rooms to extend below it. Thus the passengers are accommodated upon the level of the main deck. They have plenty of air and ventilation. The height at which they stand above the sea allows of larger windows being formed than would be possible had they to descend a "companion" to attain their cabin, and thus a handsome airy apartis secured, removed as much as possible from unpleasant smells, which are always the stronger the further down you go in a ship; while a considerable space is gained beneath for extra stowage, which would, of course, have been lost had a dull, dingy, close-smelling cabin been "howked" in the recesses of the ship. A similar arrangement now very generally holds in the American packets; and different modifications of the same plan, such as round-houses, cuddies, and so forth, have been long familiar to the passengers of East India ships. Forward of the deck cabin, in the *Owen Glendower*, is an excellent arrangement of pens for live stock, and a compact cooking apparatus; while the crew are accommodated beneath a raised forecastle upon exactly the same principle as the passengers abaft.

Above Mr. Green's fine ship is a rigged model of a class of vessel which is making great and rapid innovations upon our old-fashioned mercantile marine—the Aberdeen clipper schooner. The port in question has taken the lead in the production of this very beautiful, very safe, and very fast class of vessel. Indeed, the Scotch ports on the eastern coast, particularly Leith and Dundee, stand conspicuously out by their excellence in constructing a new class of exceedingly elegant and exceedingly rapid ships, which will, no doubt, gradually come into universal use, and fling totally out of employment our old-fashioned clumsily-built coasting craft—the Newcastle and Sunderland tribe of brigs, for example, which are a disgrace to our age and our country

The "clipper" is constructed upon the general theory, that a small amount of stowage-room may be advantageously given up to secure a great amount of speed, and with that speed a preference for cargo and a greater degree of safety from the accidental risks of the sea; since no one can dispute that a vessel able to go ten or twelve miles an hour, stability not being sacrificed, must, in the nature of things, be a more secure ship in every respect than one which is able to go only five or six. The clippers were, we believe, first built to carry up perishable cargoes of salmon from Norway and the north of Scotland to the Thames. They are now commonly used in traffic for the conveyance of easily-spoiled goods, and for that of cattle, which are deteriorated in condition by being long at sea. The general fruit trade from the Mediterranean, the orange trade from the Azores, as well as the Scotch coasting traffic are now almost entirely carried on by clippers—craft of as beautiful an appearance on the water as any of Cooper's slaving, or pirate, or privateer schooners, and able to go from the Nore to the Humber in the time which a clumsy Newcastle brig would take to work down the Swin to Harwich. The fast increasing class of screw-propeller boats—principally devoted to traffic in cattle, between the Thames and Ireland, and Holland—are also built and rigged on clipper principles; and Aberdeen has recently been asserting her right still to continue in the van of the race in naval architecture, by building clipper ships of large tonnage, one of which, in a voyage from China lately, beat an American ship, loudly trumpeted as the fastest vessel which ever bore the stars and stripes, and consequently, of course, in the opinion of Yankee-land, the fastest vessel in the world. The model in the Exhibition shows that the Aberdeen clipper schooners, while they are formed abaft much upon the ordinary moulding of a yacht—that is—as we have explained, with a long and fine run, and very high from the bottom of the stern-post to the taffrail, are modelled forward upon the principle of the bows of a Clyde-steamer, involving great sharpness, rising into a concave shoulder of exaggerated hollowness compared with that mere tendency to concavity which we have described as characterising many new vessels both men-of-war and merchantmen. The effect of this construction is not to prevent the vessel pitching, but to cause her to pitch without being wet, the overlapping portion of the bows flinging the water downwards and backwards from the obstacle, while the sharpness beneath enables the ship to slide quickly and steadily through the water. As yet, with few exceptions, the clipper-build is confined to coasting craft; but the initiative has been taken in the con-truction of large full-rigged ships upon the same principle; the success of more that one of which hailing from Liverpool and Aberdeen has lately formed the subject of newspaper paragraphs. Of the coasting craft, a few, but only a few clipper brigs have been built, the majority of the smaller vessels being schooners. In the rigging, considerable improvements, both as respects lightness and elegance, have taken place. The clipper is frequently less towering aloft than the old-fashioned hermaphrodite schooner; but her yards are squarer, her boom and gaff longer, and she is thus enabled to carry as great a spread of canvass and to manage the cloth with more facility than the loftier rigged vessels. The old hermaphrodite schooner carried foremast, fore-topmast, and fore-top gallant-mast, and occasionally even a fore-royal mast, in all four pieces. The clipper uniformly contents herself with a foremast and fore-top-mast, making up for the diminished height of the "stick" by the great squareness of the yards—the fore-top-gallant yard being sometimes, if we mistake not, made to come down upon the fore-topsail yard, so as to compact the rigging and diminish the leverage of the swing of high and heavy top hamper. The clipper has, further, an air of smartness and ship-shape which the ordinary merchant coaster is far from pretending to. She can go at double the speed of the lumbering collier-brig or coast-schooner, and shews beside them, too, like a hunter compared with a couple of dray-horses.

The steam-boat models are numerous, and not uninteresting. A number of bas-reliefs are shown of vessels in the process of construction by Mr. Mare, for the General Steam Navigation Company—craft of beautiful design, and which will, no doubt, turn out very fast; and there is a half-model of a 2000 tons steam screw-propeller yacht on the stocks for the Viceroy of Egypt, which is well worthy of admiration. A large model of a new paddle-wheel steamer, fully rigged and complete down to the minutest details of finish, is placed in a prominent position, facing the eastward-running inner gallery, and deserves minute inspection as a peculiarly perfect model of a first-class craft of her species. She is flush decked and carries swivel signal guns upon her paddle platform. The floats of the wheels are disposed, not, after the too common fashion, in a plane with the spokes, but perpendicularly, so as to strike the water edgewise and to expend the whole force of the paddle upon a productive lateral, and not an unproductive downward movement. A number of contrivances, more or less ingenious, of feathering paddle floats are displayed, but we understand that it is found in practice that machinery of this sort, however theoretically plausible and however supported by abstract scientific laws, has such an unfortunate tendency to get out of order as to counterbalance the nominal advantages. With improved mechanical contrivances, however, it is quite possible that the feathering system may yet be made practically available, unless, indeed, the screw achieve the final overthrow of the paddle-wheel.

The models of the *Albert and Victoria* and the *Fairy*—the well-known Royal yachts—excite much attention. We do not know, however, whether we are to place perfect credence in the miniature presentment of the larger vessel. Soon after the launch, it was popularly reported that she was a contemptible botch, and that all sorts of tricks and sly patching had been resorted to in order to make her sail respectably. Whether these stories were true or not, we cannot vouch, but it was often asserted, and never denied, that, as in consequence of some mistake in her lines, the *Victoria and Albert* went fastest when down by the head. she was ballasted so as to bring her into this position, and then built up upon, so far, of course, merely as the bulwarks went, and new painted to conceal her awkward sit upon the water. Be that as it may, however, the *Victoria and Albert* now goes very quickly through the water, a consummation for which she has, in some degree at least, to thank the immense steam power wherewith she has been provided. The *Fairy* is a sweetly formed and almost faultless little craft. Her speed in smooth water is wonderful, and the good weather she manages to make in rough, considering her shallowness, is equally marvellous. In crossing the Irish Channel in a gale of wind the day her Majesty returned from Belfast, we are told that, except mere spray, she did not ship a couple of buckets-full of water, while we can bear personal testimony to the fact, that the sea washed in tons over the fore part of the deck of the *Curadoc*, one of the new crack Holyhead and Kingston packets, while crossing at the self-same hour. Not far from the models of the Royal packets is one of the screw steam yachts built by Mr. White, of Cowes, for the Emperor of Russia. The *Peterhoff* seems much such a vessel as the *Fairy*—very fast, extremely elegant and graceful upon the water, and made a good sea boat by the very force of her lightness and buoyancy, combined with a sharp wedge-like outline, which enables her to slip through head seas, offering them but a very trifling resistance.

In the same case is a large and handsome model of a Gravesend boat, the *Jupiter*, said to be the fastest on the river Thames. She is immensely long and narrow, with vast paddles, and will probably go at high velocity, but is only intended for smooth water. Close to her is deposited a curious contrast, in the shape of a model of a Roman galley, showing the way in which the oars were worked on board these eminently clumsy vessels. Beneath the water line the model is round and lumpy, with very little indication of a run, but we much doubt whether any authority exists for the exact mathematical proportions actually observed by the early Italian shipwrights. What may be called the main deck is very low down indeed—a mere flooring, in fact, above the keel; but upon it are erected double platforms of four different heights, each platform seating five or six rowers, who grasp the vast sweeps by which the vessel is propelled. The arrangement of these sweeps is curious. The circular holes through which they pass run diagonally from the upper gunwale sternwise towards the keel, the benches within of course observing a similar

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disposition. Upon small patches of deck, running round the bulwarks, and crossing from side to side—somewhat in the fashion of a steamer's paddle bridges—the warriors stand; and at the stem and stern there are species of covered receptacles, surrounded by circular wooden roofs, which afford shelter from the weather and the sea. It is difficult, however, to get anything like a clue to the actual accommodations for the continued residence of a number of men in these ships. The slaves who rowed—and awful slavery it must have been to tug these long heavy sweeps—probably took up their sleeping quarters upon the pricking-for-the-softest plank principle.

The two *moyen-age* ships—the *Harry Grâce de Dieu* and the *Royal Sovereign*, built by Charles II.—are well worthy inspection. The former model is rigged, the latter only a hull; her form and general mould, however, differing in no remarkable respect from, and shewing little advance in construction, over her predecessor, although the latter was built not less than 113 years before her. Both ships are piled up with huge unwieldy masses of forecastle and poop. In the *Harry Grâce de Dieu* a number of circular sentry-boxes, or watch-towers, rise all round the bulwark, as though it had been the outer wall of a fortification, and the portholes are surmounted by ranges of loop-holes for musketry. The *Royal Sovereign* appears to have been built rather for purposes of pageantry than war. She is elaborately carved, principally with Roman, or, perhaps, more properly speaking, with Latin emblems and devices; but we miss the warlike appendages of turrets and pepper-box towers which gave the true *moyen-age* ships the air of sailing castles—the idea of the architects having, indeed, manifestly been to manufacture a species of feudal floating fortress. The rigging of the *Harry Grâce de Dieu* shows us the earlier stages of the combination of the still-existing square rig, with the lateen disposition of yards common to feluccas and their northern offspring—luggers. She carries three masts rigged square, with huge round tops; the two after-masts showing the lateen rig, which afterwards changed into the common schooner fore-and-aft mode of slinging the yards, still in existence, and which is based upon the same principle as the felucca arrangement of the Mediterranean. Altogether, the two models are so interesting as to make us again regret that they only show two incidental eras in the history of our naval architecture—two accidental links in the chain which began with the log or bark canoe, and ends for the present with the 120-gun ship, carrying 84-pounders on her lower decks, and flinging thousands of pounds of iron at every broadside.

Passing to the department principally devoted to the exhibition of life-boats and the partial machinery of ships, we observe two models of square-rigged masts, intended to illustrate the shape, manufacture, and working of a new species of blocks, dispensing with the clumsy outer strapping formerly in use, bound with iron, so as to make them very much stronger than the old-fashioned implements, while they are not by any means so heavy. The advantage in the purchase communicated by the new blocks is shown by an arrangement of weights, and they are certainly more compact and more elegant-looking, so far as a block can be called elegant, than the old implement.

The anchoring gear department shows a great number of windlasses and capstans constructed upon the new principle of heaving up the anchor by a pumping motion, which imparts a continuous movement to the cylinder on which the chain is wound, while it communicates a power of leverage unattainable by the rude old handspike system. The ancient windlass—and its use was all but universal in coasting craft until within the last few years—was a peculiarly rude and clumsy instrument; and heaving up the anchor by means of it was a laborious and a particularly tedious job. We are glad to observe how rapidly the new pumping windlass is coming into observation, and to note the number of modifications of the principle submitted by inventors and improvers, showing that the subject is one attracting general interest. The form of the anchor itself has also undergone great changes within the last few years, the leading invention having been that of Porter's patent anchor. The principle of this improvement, several versions and modifications of which are exhibited, is very simple. In the old anchor, the weight of the chain lay upon the single arm which caught in the ground; the other was, for the nonce, useless. In Porter's anchor, the arms form one solid piece of iron, moveable and working through the head of the shank. When one fluke bites, therefore, the arm to which it is attached spreads out at a blunt angle from the shank—a circumstance which vastly increases its holding power, while the opposite fluke closes down upon the shank and rests there, thus dividing the strain over the whole of the members of the implement. An objection made by sailors to Porter's anchors is, that if the cable parts, or is slipped, they are very difficult to fish up again, as there is no arm sticking up for the drags and so forth to catch hold of. On the other hand, this fact renders the cable less liable to foul; and it is undoubted that Porter's anchors are far more potent in their grasp of the ground than the old machine.

Amid a number of glittering binnacles, compass-cases, and so forth, very prettily ornamented, we come to a dingy old relic, no less than the quadrant which Captain Cook used in one of his voyages round the world; and then, passing round the extremity of the stall, we note the gun for discharging harpoons at whales, and a similar implement for conveying a line from the shore over a wreck, so as to establish communication. A notice attached to the whale-gun informs us, that, since 1844 (we think), 183 whales have been taken by its instrumentality. Ingenious, and no doubt often effectual, however, as the contrivance is, we suspect that most whalers would prefer a good harpooner to any weapon of the kind, and that Long Tom Coffin's quickness of eye, and steadiness and force of hand, would do the work even better than the spear-darting machine before us.

Noticing—for we find that we have no space to extend our remarks—the curious model of a sloop or boat with a deep sliding keel, the lower part of which slips into the upper when she touches ground, we close our account by calling particular attention to the vast number of models of life-boats displayed, suited to any coast, and involving every principle of buoyancy; many of them mounted upon wheels, so as to be quickly drawn to the most favourable point for launching, and the carriage framework of others so contrived as to form ways along which the boats can be made to glide readily into the surf.

MECHANICAL FORCE.

WHEN the Crystal Palace was first opened to the public, the visitors were satisfied to promenade up and down the Nave, and survey the Building from various spots, to see the beautiful effect of the vistas and to contemplate the novel scene to which this structure had given origin. By degrees, little excursions were made to the interior of the Austrian sculpture-room, or to take a peep at the little fountain of eau de Cologne. After a time, the desire to be made acquainted with the objects exhibited has induced the public to stroll into the more distant parts of the Building; and now those who have been constant visitors since the opening have begun to extend their observations to the Mechanical Contrivances. As far as mere brute force is concerned, man is surpassed by various animals in many particulars; still, in the delicacy and multiplicity of the movements of the fingers of the hand, he greatly surpasses other creatures. Still, by the hand alone but a small portion of the manufactures for which this country is so famous can be made; and we have now to consider some of those mechanical contrivances which are adapted to the machinery which is exhibited.

The power by which all the machines are kept in motion is derived from a series of steam boilers, in a building completely detached from the Crystal Palace. The water is evaporated by means of the heat of the fires, and the steam generated is competent to exercise a certain pressure, which thus becomes the force to move all the machinery at work. In this building we have a novel means of communicating this power, because the steam from the boiler is carried by a large pipe to all the numerous steam-engines which work the various machines. This is a mode of procedure which is seldom adopted, as usually manufacturers employ but one or two steam-engines, which give motion to what are termed main shafts, which act over the building. The ordinary mode which manufacturers adopt is well seen at the extreme western end of the Building, as one or two shafts are there employed. In manufactories these shafts run from end to end of the building, and communicate by straps from floor to floor, so that the engine can keep in motion every machine in the whole building. These machines are connected with the shafts by leathern straps, and lately straps of gutta percha have been much employed. This material slightly contracts in time, and hence it is found to have the advantage of hugging the wheels over which it is placed.

In examining the various contrivances, we find that the several parts are so devised, that either a small force is applied over a great space, or greater force over a small space. In other instances force is regulated, or accumulated to produce great effects at intervals; or various effects are produced simultaneously, or in a various order of succession.

In the first place, having any definite amount of force, man is enabled to obtain a great result, but only over a small space. The lever is an instrument much used for such purposes. By it a man is enabled by his own natural powers to exercise an enormous power over a short distance. Many of the objects have been moved about the Building by this contrivance, and results have been obtained which could not readily have been accomplished without its aid. The screw, also, is another mechanical contrivance greatly used in the construction of the Building, and also in the various mechanical adaptations. By it the human force can be so applied, that the continuation or repetition of a power insufficient to obtain the result at once, is competent to exercise enormous force by degrees. A similar effect can be obtained by means of pulleys: for one or two men, by winding a considerable quantity of rope, can apply a repeated effect of force, and lift a weight which, by their own individual powers, could not have been accomplished. The visitor may see pulleys amongst surgical instruments to reduce dislocated arms, and many samples of cranes are shown. Another example of obtaining vast power by a repetition of the exercise of but a moderate force, is well seen in that vast hydraulic press which raised the Britannia Bridge. Here we have a large surface of piston in the press, against every part of which an equal pressure is exercised—the power being applied through a small pump, against which the pressure would be comparatively nothing. In point of fact, a certain amount of force, say one pound, is added per minute, and thus in an hour sixty pounds of force would be exercised. This vast hydraulic press may be examined at the right side of the Western Nave. Again, great force can be applied by wheels revolving at a certain speed, being connected with other wheels with a much larger number of cogs, so that the second wheels can go at a much slower speed than the first wheels. Various beautiful specimens of rolled metal are shown in different parts of the Building which have been made by wheels slowly revolving.

In mechanical contrivances we not only require to get a great power over a short distance, but sometimes we desire extensive motion. Now, to obtain an extensive range of motion from any definite force, we have recourse to the reverse contrivances for the exercise of a great power over a small space. We then apply the force to the short end of the lever, we then make a larger wheel turn a smaller wheel, and, in fact, we reverse every process which is adopted for the former case.

Many ingenious modes are adopted to give motion from one part of a machine to another. Such motions, parallel to each other, are easily given by straps and belts, as may be seen in many parts of the room for machines in motion. Sometimes we require a second motion at right angles to the first, and then a bevelled cog-wheel is often employed. Frequently a to and fro motion is required to be converted into a circular one: this is required in every steam-engine, as the piston moving backwards and forwards causes the crank to turn round. This motion may be observed in several steam-engines, and the visitor should be careful to examine the various different plans whereby the piston communicates with the crank. In cases where the extent of this circular motion is limited, the effect may be obtained by the pinion and rack, a pretty example of which on the large scale may be noticed in the working model of Armstrong's hydraulic crane.

In some cases we have various contrivances for the accumulation of the force. The fly-wheel is an important adaptation of this character. It consists of a large mass of metal, which revolves at a certain speed, and by its means any sudden force may be applied without materially checking its speed. This contrivance may be observed in many of the steam-engines. In some cases a great mass of matter is raised, as in the machines for pile-driving, which comes down suddenly and produces great effect. A very pretty plan has been lately devised for making guns for discharging harpoons. It has a number of vulcanized India-rubber springs, and these collectively could not be moved by the force of many people, yet one by one each spring may be put upon the stretch by the manual labour of a single person, and when the force of all has been obtained, a power exists for throwing harpoons for killing whales superior to any heretofore used. This very interesting mechanical contrivance was designed by Mr. Hodges, who observed that the black men raised enormous logs of mahogany by beating down a great number of small trees singly, when the sum of the forces raised the log, and enabled them to move it in any direction. Thus we find that one of the more remarkable inventions in the Exhibition has been made by observing a class of men whom civilised nations consider as so far inferior as still to be kept in abject slavery, and even by a country whose inhabitants consider themselves to be the acutest people in the world. We fancy in this invention we see the germ of a new application of a great principle, and therefore we particularly direct the attention of our readers to it.

Mechanicians regard the steam-hammer of Nasmyth as one of the more remarkable contrivances of modern days. It is placed on the right-hand side of the Western Nave. This great mechanician so contrives that a great mass of metal, weighing as much as 5 tons, is raised to a considerable height, and accumulates force through a space of perhaps 5 feet, when it is capable of giving the most enormous blows. It is, nevertheless, so perfectly under control, that the workmen are in the habit of putting a nut under the hammer and cracking it without injuring the kernel. As this contrivance is famous amongst the manufacturers of all nations, we advise the visitors to look at this machine.

By means of the spring force is accumulated, as in the winding of a watch. A certain quantity of force is husbanded, as it were, to produce its effects when required. Sometimes water is pumped to a height to accumulate force; and at others a vacuum is formed, into which, at any moment, air may rush, and which thus serves as a reserve of force. Another instance of the accumulation of force to act as a reserve is seen in the use of weights to fall when required.

When a force is obtained, it is necessary to regulate its action and character. The pendulum is found the most certain regulator, as by it the rate of the movement is determined, and according to that of movement so is the force expended. Where steam-engines are used, governors are employed. They generally act by centrifugal force, whereby two arms are thrown out, and close or open the cock which supplies the steam. Amongst the machines in motion may be noticed a governor, which, when in action, has the appearance of the planet Saturn with its belt. This, according to the rapidity of the movement, has a tendency to assume a horizontal posture, and regulates the supply of steam. These contrivances are a kind of spontaneous or automaton regulators; but the visitor will observe in locomotives, and, in fact, in all other engines, contrivances for enabling the engineer of his own will to regulate the amount of steam supplied to the engine.

When machinery is in motion, sometimes the movement must be continuous, as in the case of the cylinder of the printing-press of the ILLUSTRATED LONDON NEWS, which continually goes round. At other times the movements are only occasionally required, as with those artificial arms which throw the shuttle in the different looms. The visitor should carefully examine them, as it is truly marvellous to see one arm throw the shuttle and the opposite return it. This interrupted motion is produced by a wheel, with a projection at one point, which lifts a lever at one part of its revolution, and by this throws the shuttle.

In some machinery a different rate of speed is required at every part of its action. The perfection of De la Rue's envelope folding machine, which attracts such crowds of observers in the Western Nave, is due to actions of this kind, which are given by lines of varying curves upon a circular disc, and which is called a cam movement. The perfection of Dunin's expanding model of a man is due to movements somewhat analogous to the cam, the curves of which were the subject of elaborate calculation.

One of the more remarkable results which are obtained by a combination of mechanical contrivances, is the machine for making cards for carding cotton. A piece of wire passes into the machine, is cut off at suitable lengths, receives its proper bend, and is thrust into the cloth. This machine will, doubtless, amuse visitors as much as any in the Building, as it really appears to perform the duties of the human hand.

The properties which bodies possess of being thrown from the centre on revolution is now employed to many purposes. This centrifugal force, as it is called, is used for drying cloths. If wet cloths are placed in a frame and revolved with great rapidity, the moisture is thrown off. This property has been used for purifying sugar, and a beautiful sample is shown of sugar deprived of all its brown matter by this process. Mr. Appold has applied this principle to the pumping of water, and vast cataracts are discharged, to the great delight of the visitors. Besides this pump some centrifugal pumps are shown.

There is a class of machines which belong to the higher order of mechanics, as, according to circumstances, they act either in one way or another. A specimen of such a contrivance is seen in the weighing-machine, for separating light coin from that which is heavier. One natural philosopher speaks of such machines as exhibiting judgment, and affording a faint image of the operations which are naturally performed by the brain. Another speaks of this as the perfection of mechanics. The first idea of such a machine was formed by Mr. Cotton, formerly Governor of the Bank of England; and he not only has the merit of having conceived this application of mechanics, but also, unaided, of having perfected the invention so that it has become the most trustworthy instrument which can be employed. The French have sent an instrument which divides coin into three parts—light, heavy, and standard, though most engineers seem to consider, that, although invented after, it is even not so applicable as the beautiful machine which so astonishes those who are fortunate enough to get an order to visit the Bank of England.

In the department of machinery in motion there are other cases where the machine acts according to circumstances. Amongst all the power-looms a thread is very apt to break; and if it did break the whole cloth would be spoiled, if the machine were not stopped. A contrivance is appended whereby the moment a thread breaks the action is stopped. This action according to circumstances is very interesting, and we recommend our readers to wait to see the thread break and the machine stop, till the mischief is rectified.

Besides machines which act according to circumstances, there are others which have a line of action impressed upon them; we always look at these contrivances with pleasure, for they appear to be to mechanism what instinct is to the organization of birds. We are writing with a number of nests of the same bird before us; and all are alike—the impress of the design appears to be fixed upon the organisation of the creature; and the stork which built its nest on Trajan's Column, built a similar nest to the storks which now build up the Rhine. In the Jacquard loom a definite line of action is arranged for the machine by the manufacturer, which it implicitly obeys; and two pieces of work are as exactly similar as two bird's-nests. Many of our readers will now have an opportunity of observing how the patterns in the dresses are made, and they will notice how the design is formed, by punching small holes in cards, which regulates the action of the threads by means which we have not space at the present time to describe. Piece after piece may be made by the same loom impressed with the same design, and the pattern of each will be exactly the same.

The mechanical powers by which the results have been accomplished are various. Animal power has been used in many manufactures: most of the works of art have been made by the animal power of man, assisted by tools alone, though Cheverton has contrived a machine whereby busts, &c. may be multiplied. Power derived from the weight of solid bodies is also sometimes used, and many clocks are kept in motion by the falling of a weight. At other times the weight of fluids is brought to bear, and we recommend the visitor to examine the models of the great overshot water wheels which pump out the water from the Devonshire mines. These gigantic wheels work by means of a very small stream of water, which has a good fall, and by their aid the mines are kept clear. These wheels are always at work in the department of Machines in Motion. Another very curious example of a power from falling water is seen in the hydraulic ram. In this case the water gets a velocity from running through a long pipe, which, being suddenly checked, is enabled to rise to a considerable elevation. There are two specimens of this interesting contrivance, one in the North Transept, the second amongst the machines. Mechanical power derived from electricity we have already noticed in former articles as being applied economically to clocks, but not to other purposes.

The great source of power, however, is steam, which has its origin in combustion. The mechanical force derived from steam enables us to travel with the velocity which in former times was only seen in the flight of the bird. It enables us to traverse the seas, and practically joins continents thousands of miles apart. We see the perfection of the adaption of mechanical force derived from these various sources. We may view the huge engines of the Great Western and North-Western Railways, and marvel at their excellence; we may be astonished at the machines which are actually shown, still the philosopher delights to look for new applications of force, and in the Exhibition he is doomed to disappointment, for there we do not find any new mode of generating mechanical power. The question naturally suggests itself as to whether combustion and the generation of steam is the plan best suited for man, or whether there may not be other means yet to be discovered, wherein combustion may be superseded by some other change of matter, or the generation of steam may be supplanted by other physical properties. The great display of human ingenuity has well indicated the value of steam; but it must remain for future ages to determine whether other means may not be adopted more conveniently and economically.

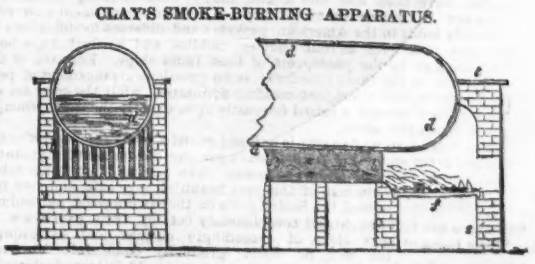
Various modes are used to resist the action of force. In Cox's soda-water machine, we have contrivances of great strength to resist a pressure of 120 lb. to the square inch, and the soda-water bottles themselves are made to bear such force that not one in a gross will burst. This result is obtained by making them of a round or oval form, without any angle. In all the high-pressure boilers the circular form is also adopted. In the construction of the Building, the perfect adaptation of the knowledge of the thrusts and resistances is exemplified, for the whole structure has only been erected by putting the right quantity of metal in the right place; and when the visitor views the perpetual rows of lines in the girders which support the roof, he should not forget that every one has its function—that not one can be removed without detriment to the strength of the Building. The resistance to the force of gravitation is nowhere better seen than in the Britannia Bridge, where a right amount of materials has enabled the engineer to effect an heretofore unheard of span. The mode in which the Americans build cheap bridges is well deserving attention; and there are many other contrivances for resisting the action of force which may be noticed.

In recapitulating the various mechanical contrivances of which we have taken a brief review, we find that six points deserve attention. First, the source of power—whether it be animal power, whether it be derived from heat, electricity, &c. Then we look to the point where the force is accumulated, as in the steam-boiler, fly-wheel, vacuum apparatus, spring, &c. Then we regard the mode by which the force is regulated by the governer, &c. Fourthly, we study the apparatus employed for adjusting the direction and the extent of motion. Continuing our investigations, we study the point at which the work of the machine is being performed—be that the folding of envelopes, be that the twisting of threads, be that the forging of steel. And, lastly, we may study the result of the manufacture. In this mode of studying the machinery, we begin with the change of matter which gives rise to the force, and we finish with the change of matter which constitutes the manufacture.

This article will conclude our sketches of the four great forces—electricity, light, heat, and mechanical force—the capacity to generate which distinguishes man from all the lower animals. The electric eel and torpedo may give terrible shocks, but they cannot make the battery; the glow-worm and fire-fly may send forth their brilliant lights, but they cannot make the candle; the elephant may uproot huge trees, but he cannot make a lever; and the bird, although it is rendered lighter by the high temperature which is generated within its frame, cannot make a fire. These sketches have been written rather to assist the observation of the visitor than to give a perfect description of the objects themselves. Many exhibitors of beautiful and interesting objects have expressed themselves hurt that their valuable contrivances have not been mentioned in these general articles, but these will form the subject of further examination; and the ILLUSTRATED LONDON NEWS will endeavour to lay before its readers a detailed description of all such objects as will be interesting to them.

The minds of the reviewers, no less than those of the public, have hardly as yet been enabled to grasp the magnitude of this Exhibition. Manufacture after manufacture, and machine after machine, crowds before the mind, and no one can do more at present than give a passing glance to discover the treasures which the Building contains. Sometimes the objects contained in a single case are of such interest that they would take hours to examine, weeks to understand, and would require pages of print for their complete elucidation. Here the greatness of man is well shown; here his dominion over the forces of matter, and his control over the power of animal force, is nobly exemplified. Within the Crystal Palace he well appears as the lord and master of creation, but no sooner does he cross the threshold of this Building than his own insignificance becomes apparent. When he compares the beautiful scene within the Building with the lovely landscape which exists in Kensington Gardens—when he compares the roof with its multitudinous lines with the vaulted roof displaying the starry firmament of heaven—then he is in a condition to appreciate the infinite perfection of nature, and in some degree comprehend the immeasurable distance which exists between the works of man and the creations of God.

CLAY'S SMOKE-BURNING APPARATUS.



In these days of sanitary improvement every invention calculated in the slightest degree to mitigate the smoke nuisance must be regarded

PRESENTING A BOUQUET TO THE PRINCE OF WALES.

with satisfaction. Mr. John Clay's apparatus for this purpose seems entitled to consideration, and we have threfore thought it worthy of being illustrated in our pages. The two Illustrations consist of a transverse vertical section and a portion of a longitudinal section of the boiler, furnace, &c. *b b* represent the back partitions, *c* the bridge, *d d* the boiler, *e e* the furnace, and *f* the furnace bars. The novelty of this apparatus consists in dividing the volume of smoke at the bridge, and causing it to pass between and along the passages formed between the brick partitions *b b*, thereby rendering the latter red-hot, thus keeping up the temperature to a high degree, and causing it to be fired as it passes through the heated channels with the air introduced at the four ventilators. A steady combustion is kept up by observing regularity, on the part of the stoker, in supplying fuel to the doors of the furnaces alternately.

PRESENTATION OF A BOUQUET TO THE PRINCE OF WALES.

Our Artist here represents an incident not unworthy of being recorded in connexion with the grand solemnity of the inauguration of the Crystal Palace on the 1st of May. The son and daughter of Mr. Younghusband, who supplies some of the refreshments, having previously obtained the permission of her Majesty and Prince Albert, respectively presented the Princess Royal and the Prince of Wales with a handsome Bouquet, soon after their arrival, and whilst on their way with their august parents to the Royal pavilion in the centre of the Transept, and which humble offerings their Royal Highnesses accepted in a very gracious manner.

CARVED PICTURE-FRAME. TUSCANY.

The specimens of wood carving from Tuscany are of a very superior order of merit, the devices being generally in good taste, and executed with extreme delicacy of finish. Amongst other matters in this line with which we have been struck, are some small picture-frames, in walnut-tree wood, by Lombardi and Barbetti, both of Sienna, one of which we have engraved.

SCENES IN AND ABOUT THE GREAT EXHIBITION

CONSTANTIN'S ARTIFICIAL FLOWERS.

THE PIANOFORTE GALLERY.

Now that the frequenters of the Great Exhibition are becoming familiar with the general arrangements of its varied contents, it is curious to observe the manner in which they congregate in groups about the particular objects interesting to their several tastes: practical men and utilitarian ladies devoting their attention to the machinery department, where new wonders of mechanical and manufacturing skill astonish them at every turn; connoisseurs in articles of vertu lounging about the Gobelins room of the French department, or the sculpture and furniture rooms of Austria; the general masses on these shilling days crowding round the great diamond, and the Indian tent, and the great printing press, and the Queen of Spain's jewels, and a thousand other wonders which give them

CARVED PICTURE FRAME.—TUSCANY.

much to talk about whilst they are there, and will give them more to talk about when they go home. Even outside the Building, amongst the eager crowds approaching it, there are scenes worthy to engage the attention of the observer of mankind, and to employ the painter's talent—scenes of peaceful bustle which will become memorable in after days, on account of the singularity of their aspect in a social point of view, and of the all-interesting event of which they are illustrative.

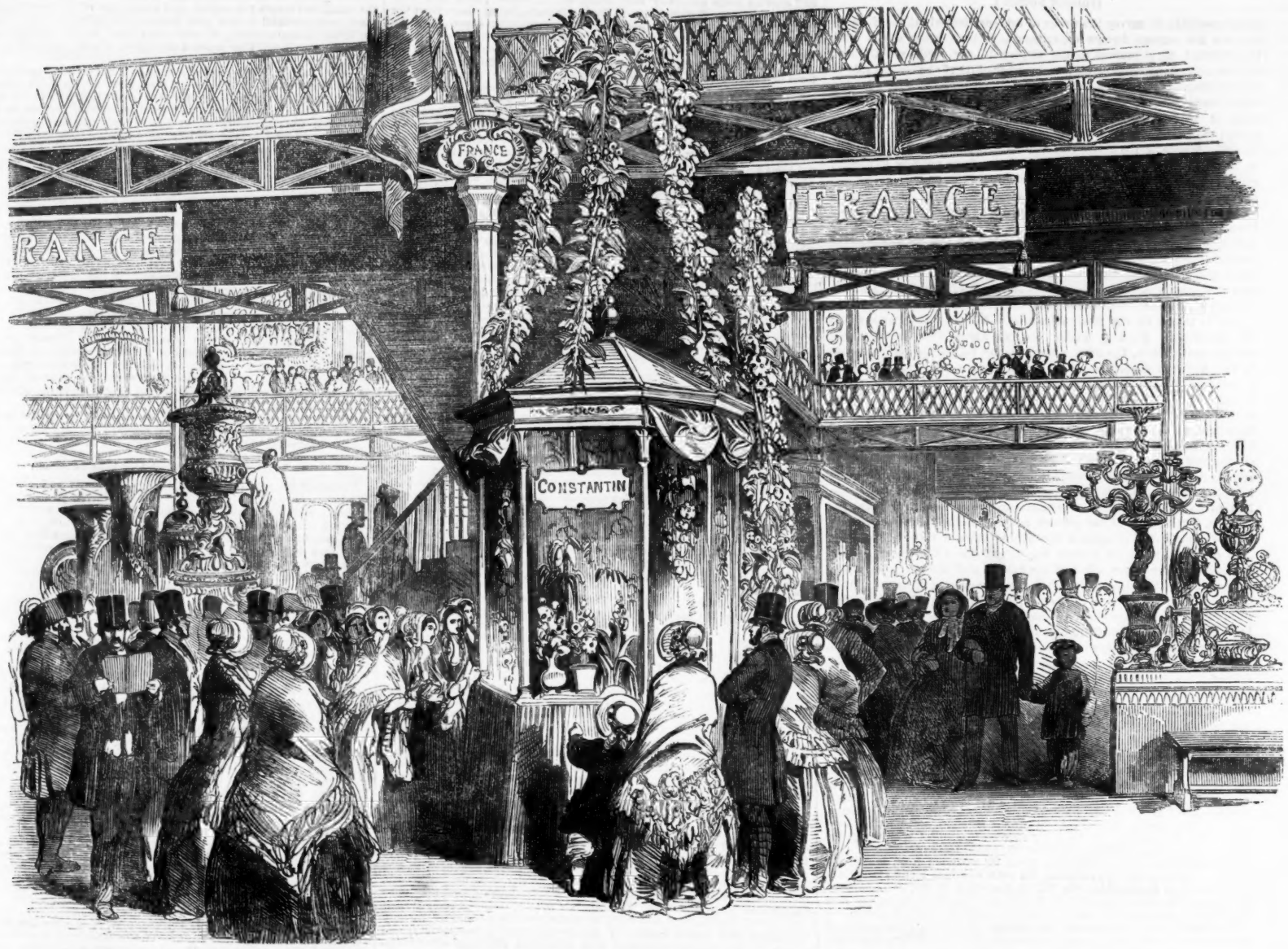
Our Artist will, from time to time, try his hand at some of these subjects. On the present occasion he has selected Constantin's "Conservatory" of artificial flowers, and the Pianoforte Gallery, both favourite resorts of the ladies.

We wish we could, in this hurried notice, do justice to the exquisite truth and delicacy exhibited by M. Constantin in an art which he may fairly be said, if not to have created, at least to have brought to a point of excellence which it had never reached before. As, however, we shall return on some future occasion to the subject of artificial flowers, we will only here add, that those of M. Constantin's productions are hardly to be called so, being, in beauty and in almost everything but smell, identical with those of nature. Roses, lilies, hot-house plants, ivies, and endless other varieties, are here before us, as it were, in *propriâ personâ*, and not always in full bloom, but occasionally represented, with most truthful effect, in their day of declining and withering, with the canker-worm at the core, and blight upon the face. All these wonderful realisations are produced in one material—cambric; and very high praise is due to the artist who has achieved what he has done with it.

2.—INNOCENCE DEFENDED BY FIDELITY.—BENZONI

3.—GRATITUDE.—BENZONI.

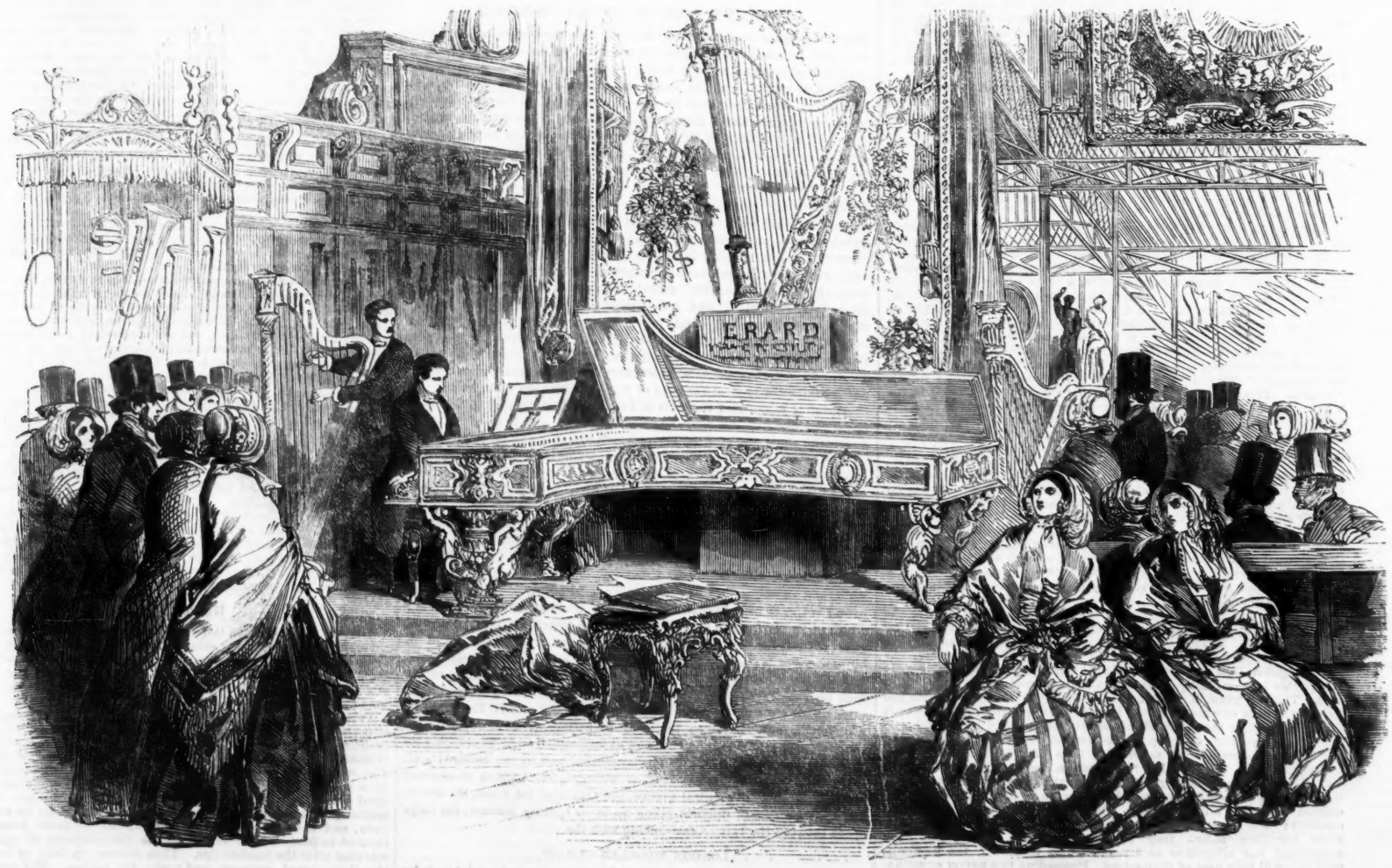
The above are two pleasing little *pièces de genre* in marble, executed by Gio. Maria Benzoni, of Rome. One represents a little girl fallen asleep in the midst of her frolics in the fields, whilst her favourite dog tramples upon an adder which would otherwise have bitten her, looking up in her face well pleased at his achievement. In the other, the little girl shows her gratitude to her canine friend by extracting a thorn from his foot.



LOUNGES IN THE EXHIBITION.—CONSTANTIN'S ARTIFICIAL FLOWERS.

The pianoforte and harp compartment, in the North-western Gallery, s crowded throughout the day, chiefly by ladies, who thus rest from the labours of exploration, whilst they derive exhilirating impulses from the polkas, galops, and waltzes, which, intermixed occasionally with more classic *morceaux*, are for ever given forth from pianos by Erard, Collard, Broadwood, and others.

So absorbing is the power of the traffic-din of the Great Crystal Palace, that, although there are sometimes half a dozen musicians working their hardest in this department, they scarcely interfere with one another—each having his own particular audience. Wonderful Crystal Palace! Wonderful crowds that fill it, and throng through it, and seem to have adopted it as a new resting-place and a new home!



LOUNGES IN THE EXHIBITION.—PIANOS OF ERARD.

SCULPTURE.

(FOURTH NOTICE.)

IT is impossible to survey the works of art—particularly those of sculpture—in the various foreign departments, without being struck with the contrast they present to the display in our Sculpture Gallery, and the miscellaneous contributions in other parts of the British side of the Building. It becomes, indeed, but too obvious, that whilst foreign artists have received our national invitation in good faith, and acted upon it with alacrity, British artists have held aloof, and disdained the friendly competition to which they had tacitly given their assent. Where is the blame that British artists have been thus remiss in their exertions to aid the general cause, we have not now to decide; certain it is, that, as far as the purposes of this Exposition go, British art may be said to be wholly unrepresented, the actual display being limited to some score or two of rough plaster models, many of which have been drawn from a long seclusion in the darker recesses of the studio, to be thrust forth to take their chance of "a commission" in the general *mêlée*; whilst the Art Union candidates, congregated in the midst, throw ridicule over the whole affair, and might lead the stranger to entertain very erroneous notions, as to the standard of excellence, and the honours and rewards that attend successful merit in this country.

But to return to our foreign friends. Although old Rome would of prescriptive courtesy claim our attention first amongst the foreign contributors, the more numerous and varied display presented in the Austrian department must be our excuse for giving the latter precedence on the present occasion. The little chamber, with its ante-room, which has been allotted to the various nations owing allegiance to the Imperial House of Austria, for the exposition of their productions in sculpture, is crammed full of works of the highest finish, not in plaster, but in marble, affording very interesting means of studying the actual state and the prevailing tendencies of the various schools followed by nations distinct in themselves, and some of which have had little intellectual intercourse with the older art-fields of Europe. Not to go too deeply into generalities upon this head, we may first observe, as the result of our present notes upon the various collections, that as Milanese art occupies a sort of middle place between the colder classicism of the modern Roman school, and the wilder fancy of Germania—the more virgin minds of the central and eastern states, whilst they are not without their share of the impulses evinced by others of their day, give a hint in some of their examples of working after the models of the more ancient schools of Greece, the predecessors of those of Italy herself. In many cases there is much to condemn: experimental conceits, manipulative achievements unworthy of art, and incongruities in composition which sober judgment cannot reconcile either to the requirements of poetry or of common sense; in short, many instances of art misdirected, and marble misapplied, some of which it will be our duty to refer to more particularly as we go along. But, with all these drawbacks, there can be no question, that, viewed as a whole, the Austrian Exposition in sculpture is one of the most creditable and interesting we have ever seen brought together by contemporaneous artists.

We must remark, by the way, that the Austrian Gallery, limited in dimensions, is always inconveniently crowded. Forcing our way through the ante-room, we are by no means favourably impressed by a group of "Atala and Chactas," by Innocenzo Fraccaroli, of Verona, which is a commonplace affair enough. This artist, we should mention, has another work of a much higher class in the main avenue, "Achilles Wounded," the attitude of which is striking and effective, whilst the expression of pain and horror in the face, as the hero views his wounded heel, is well depicted. An attempt at exhibiting the more essential feeling of which the incident is susceptible—the full appreciation of the evil omen attaching to the mishap, would have heightened the effect, and given that touch of historic poetry to the character, of which it is now deficient.

To return to the ante-room of the Austrian Gallery: on either side of the table are two infant subjects, by Antonio Galli, of Milan, and Benedetto Cacciatori, of Carrara. True, the gilt ring or halo round the head of the one implies that it is intended for the Infant Christ, whilst the other, lying on a rocky surface, is supposed to be John the Baptist. But there is little attempt at impressing the divine character upon the countenances; indeed, how should it be in such mere babes as they are, and asleep too? And, divested of this, what of high or poetic interest can attach to a marble representation of a human subject before it is formed, even in the stage of boyhood, and as yet ungifted with the intelligence and impulses of our nature? In painting we have abundant instances of the introduction of the Infant Saviour, as part of what is called "the Holy Family;" but, except in some few cases where the child is depicted as already inspired with the prescience of his divine mission, and as in the act of blessing the spectator, the sanctity of the subject is generally realised by the devotional and reverential regards of the mother and bystanders, all which in the single marble subject is necessarily out of the question.

"The Vintage," by Gaetano Motelli, of Milan, is a very elaborate piece of carving, representing a whole family of cupids disporting amongst the branches of a clump of vine, making free with bunches of grapes as big as themselves, scrambling in and out, between and around them, some pressing the gathered grapes in a vat below, whilst one little fellow at the top squeezes the purple juice into his tiny mouth. The figures are shown in the round; and the whole is treated as a block or centre-piece: but we submit, with all its unquestionable beauties, that the composition is one better adapted to wood carving, or, better still, to silver, as a dinner table decoration.

A group, by Democrito Gandolfi, entitled "Grief and Faith," stands in a prominent position at the entrance of the inner room, and provokes criticism as much by the incongruities involved in its conception, as by its sins against harmony of outline and proportion in the arrangement. In the foreground—fancy a foreground in a piece of sculpture!—in the foreground is a tomb or sarcophagus of large dimensions, over which leans, covering her face in her hands, a female figure; this is Grief, according to the commonplace types exhibited on the walls of every parish church in England, only that there the artist has generally contented himself with representing it in bas-relief, whilst here it obtrudes upon the floor in the fullest dimensions of reality. For the rest, Faith is represented upon a circular pedestal in the rear, in the person of a young female kneeling. This figure, we should observe, is the only tolerable bit in the whole performance, and would be pleasing enough if separated from the rest, with which, even artistically, it has no connexion. The gross error against common sense of representing a real object (the weeping female), and an ideal existence (the spirit of Faith), in the same material, and that, hard unyielding marble, must be too obvious to call for much remark. Even Reynolds was criticised for introducing in his "Death-bed of Cardinal Beaufort" the ideal presentment of the evil spirit waiting for his soul in the background; though by many he has been held to be justified, as only realising the picture presented by Shakspeare's lines descriptive of the scene. But if this was a license hardly excusable in painting, where, by means of the well-known appliances of the art, the separation of the actual from the imaginative part of a subject may be clearly defined, it is one totally unjustifiable in sculpture, where the material is capable of no such modification, either by the application of colour or the interposition of aërial media.

One of the principal show-pieces in the room, and which excites the wonder of gazing thousands every day, is "The Veiled Vestal," by Raffaelle Monti. The ambition of the artist in this production is to represent the effect of a face seen through a veil; and so ingeniously has he managed it, that at a distance of the breadth of the room, the face—the marble face—actually looks as if it were covered with a real piece of lace. This is a triumph of mechanical dexterity certainly, but upon the value and merit of which we may have some misgivings, seeing that it achieves a greater verisimilitude of the worthless rag of a veil—being to the eye reality—than of the poor face, which remains still, pale, cold stone. The ancients would never have been guilty of such profanation of their subject. 'Tis true they took pride in representing the soft outline of the limbs as rounding out and supporting the crisp light folds of the draperies of their figures (which, by the way, they seldom liked to exhibit entirely nude, except when the case rendered it necessary); but they would certainly have torn the vestal's veil from her face before they took her portrait, or would have abandoned her altogether as a subject. So much for the ancients, who can well take care of themselves. Proceeding to a nearer examination of Signor Monti's performance, we find, as we suspected, indeed knew must be the case, that his veil effect is a mere trick of art, and a trick practised to the utter destruction of the beauty of his vestal's face, whether seen from afar or near. Artfully disposing the folds of the veil, and making them generally very broad on the outer parts, and very narrow, nay, almost vanishing, on the inner parts, being those next the face, he further roughs the surface of the intermediate spaces, as if the flesh were actually covered with a veil; and these surfaces seen at a distance, take the lights in such manner, that, blending with those on the outer surfaces of the veil, they produce the general effect intended, the form of the face being dimly and indistinctly seen as through a veil. In reality, portions of it only are seen at one and the same time, and in one direction, and the effect so produced is not a genuine effect *quasi*, but a delusion; not a matter brought to the mind's eye by means of the sense of sight, but a trick played off upon the too credulous fancy at the expense of the organ of vision. Common sense and legitimate art are further outraged in this work by the introduction of a basket of *real artificial* white roses in the hands of the figure, instead of a sculptured offering in marble. The drapery generally is artificial, and the whole character of the piece is unearthly and disagreeable.

There are two other examples of the same sort of trickery in the room. One entitled "A Bashful Beggar," by Democrito Gandolfi, whose "Grief and Faith" we have already noticed, represents a woman seated by the roadside, her face covered by, but partially revealed beneath, the folds of a linen drapery, in which is also wrapped the infant in her arms. More prominent, and at her feet, are two children begging. A mile-stone, with "Dover" on it, informs us that the party are on their travels, and an inscription on a scroll upon the ground states her sad case:—"Je suis émigrante, mère, veuve, et j'ai une aneurisme au cœur." All these points show a striving after effect by illegitimate means, which pure art would disdain. The third veiled figure is smaller than either of the others, and which it may be sufficient to point out by name: it pretends to represent "A Slave in the Market," by Raffaele Monti, the artificer of the "Veiled Vestal," who seems to have adopted this notion as a *spécialité*. Indeed, it appears he has not been without encouragement, the "Veiled Vestal" being announced as the property of the Duke of Devonshire.

We turn with pleasure from these *caprices* to other works of more sterling quality, which the room contains. Adjoining the "Veiled Vestal" is another work of importance by the same artist, "Eve after her Fall. The attitude and character of the figure are full of merit, the limbs graceful, well-rounded, and realising as near as may be the softness of flesh. The artist has represented the hair in massive and dishevelled tresses hanging over the face on each side; and the executive skill displayed in accomplishing this difficult point is worthy of honourable mention, though it must by added, that the soft and flexible character of the human hair—its great beauty—is somewhat sacrificed to attain the end in view. The introduction of a little Cupid peering up from amidst a cluster of roses behind, is, to say the least, a conceit rather apocryphal in itself, and, upon the whole, had better have been dispensed with.

Antonio Galli has a "Jephtha's Daughter," very pleasing in character, simple yet graceful, and the head endued with considerable expression. Marchesi's "Eurydice," which stands next it, is also a meritorious performance; but, perhaps the sweetest and most touching effort in the room, is the little cabinet group of "Hagar and Ishmael," by Emanuel Max, of Prague. The treatment of the female figure is full of dignity and truth; the hand, thrown open as in the act of supplication, rests upon the bosom of the dying boy, whilst the steadfast and imploring look she directs to heaven reveals the whole story. All the points are finished with great delicacy and purity of handling. The same artist has a very clever bas-relief of an Amazon. The face and figure would seem the true ideal of Amazonian *physique*, and there is prodigious energy in the action both of horse and rider. The details and accessaries, which are sufficiently ample, are finished with great care, but in a style judiciously subdued; in short, in most respects, this work indicates a ripe appreciation of the purer models of antiquity, which we should be glad to find more frequently exhibited by other artists of our day.

"Ishmael," unattended by Hagar, is a subject simply painful—a poor youth in all the agonies of death from thirst; and this Signor Strazza, of Milan, has represented with terrible earnestness and reality, in a prostrate figure, life-size, which occupies a prominent position in the centre of the room. No one can deny the wonderful talent displayed in the working out of this subject: the features of the face are drawn and livid under the hand of death, and the whole figure denotes helpless prostration in its last stage. But can we look upon it with any feeling but that of shuddering? and must we not regret the absence of the only redeeming and poetic feature of which the story is susceptible, and which M. Max has so beautifully and with such touching effect introduced?

Joseph Koekszman, of Vienna, has a very pretty "Hebe," the head charmingly graceful and expressive, and the whole treatment of high excellence. We do not like so well his very tall and sentimental "Shepherd," unnecessarily denuded; nor his "Flora," who is too artificial in her attitude, and overburthened with a heavy garland of flowers extending from head to foot. Nevertheless, the face of the latter is pleasing enough.

WOOLLEN AND WORSTED FABRICS.

THESE important branches of our national industry now claim our attention, and present an extensive and varied field for observation. The growth of those vast hives of industry, the towns of the West Riding of Yorkshire, has been as much dependent upon the woollen and worsted trades, as practised in the present day, as the development of the vast population of Lancashire has been upon the cotton manufacture; the only difference being, that, while in the one case the raw material is an exotic, in the other it is grown at our own doors, and is intimately connected with the employment and prosperity of a large portion of our agricultural population.

Certainly, the complaint we had occasion to make as to the imperfect manner in which some departments of the cotton manufacture is illustrated cannot apply to that of woollens or mixed fabrics, for, in every respect, the display is a full and complete one; and although in many points, it is by no means so attractive to the mere lounger or sightseer, yet to the thoughtful visitor it presents features of a highly interesting character; and the student of art, as applied to textile manufactures, will find here, if he studies it properly, a suggestive course of instruction such as he would seek for in vain elsewhere. With an opportunity for comparing the products of various districts, the modes of production and ornamentation, the manner in which the endless varieties of mixed fabrics are wrought out, the character of colour and the style of finish, we trust that when our intelligent artizans from the north pay the Exhibition a visit, they will carry away with them hints for the future which will re-act in no small degree on our future success on these departments of national industry, and amply repay the manufacturers for any labour and trouble which they might have been at in getting up so excellent a display of their skill and judgment.

As the West Riding of Yorkshire represents the great mass of the combined manufactures set down in the official classification under the heads of Class 12 and 15, it was thought desirable that the illustration of the industry of so important a district should be as complete as possible, and an exception was therefore made in favour of the towns comprised in this important district, and each was allowed to arrange the whole of its products in textile manufactures together. This, of course, gave a hint for the management of the other towns engaged in kindred pursuits; and, with the exception of shawls, the woollens and mixed fabrics from other places are all arranged topographically rather than technically, in the court set apart for these classes of manufactures; and certainly, as a whole, it is a display which Englishmen, Scotchmen, and Irishmen too, may be proud of, since it embraces the famous poplins of the latter to an extent which must be cheering to the advocates of the national industry of that part of the empire; and, appropriately enough, the display, as arranged, has London at one end of the frontage to the central avenue, and Dublin at the other, the manufacturing towns and districts filling up, in no sparing manner, the large space between the two. Commencing with the

LONDON WOOLLEN CLOTHS,

we find a rich and varied display of high class goods exhibited by the leading cloth merchants of the metropolis; and, as might be expected, the advantages of buying from varied sources is seen in the results. Producing nothing in this department of industry, the traditionary power of its merchant tailors and wool staplers is to be seen in the command which the capital and enterprise of the representatives of these once powerful trades give them of the markets; and thus, without being manufacturers, or taking any part in the production of the goods they exhibit, they make a display of which they may very justly be proud.

Messrs. Barber, House, and Mead, of St. Paul's Churchyard (18), make a most satisfactory exposition of fine West of England broadcloths, manufactured by Pocock and Rawlings, of Chippenham, of admirable texture, colour, and finish. The Yorkshire cloths, too, are very excellent. The novelty, however, of this contribution is a series of shawls, manufactured by Mr. William Bliss, of Chipping Norton, of the natural coloured wool of the Alpa Vicunna, a species of South-American llama. These are certainly very admirable for softness, lightness, and warmth. Messrs. Brett Brothers (20); East, Landon, and Holland (9); and Scott and Wright (1), each make a display of the peculiar fabrics in coatings and trouserings which they usually supply to their customers, all of an excellent character and make. The prize-cloths of Messrs. Bull and Wilson form the leading features of the contribution of that house. These consist of black cloth of extraordinary fineness and texture, and black doe-skin of equally excellent character. As an engraving of the gold medal awarded to J. and D. Apperley, of Stroud, for the former, and Mr. W. Helme, of the same place, for the latter of these fabrics, has already been given in the ILLUSTRATED LONDON NEWS, more need not be said on the question of the prize, further than that the spirit and energy of the donors entitle them to every credit.

Examples of patent cloth, with two distinct surfaces of different colours, are exhibited by the inventor, Mr. S. Powell (8); and in examining the varied productions of the West Riding, we discover that its application is very general. It offers great advantages in the top coat cloths, since a rough or smooth-surfaced coat may be obtained in one garment. There are some excellent examples of its application to children's clothing in Class 20.

In Mixed Fabrics, the fancy vestings exhibited by Brown and Foster (9), W. and C. Murley (10), and J. Goodwin (11), are all of a very noticeable character, tasteful alike in design and in arrangement of colour.

THE WEST RIDING OF YORKSHIRE.

The arrangements for the display of the industrial productions of this important district have been commensurate with their extent and variety; and had this Exhibition done nothing more than bring together the many excellent specimens of manufacture here displayed, and thus shown to manufacturers of this great community the reliance they may safely place in their own energies, it would have done a great national service. To the thoughtful observer a walk through that portion of the court for woollens and mixed fabrics devoted to the West Riding will afford much food for reflection. He will see how completely communities, apparently employed in exactly the same pursuits, are really divided by a line of demarcation as distinct, though not so distant, as the boundaries of the towns of which they may be composed, and that the peculiar characteristics of each is not a matter of indifference. Thus, Leeds is distinctly marked by its woollen products; Bradford by its worsted, alpaca, and mohair fabrics; Huddersfield further illustrating the woollen trade, but bringing in a new element in the form of mixed fabrics, and even cotton manufactures of a peculiar class. Halifax, again, is distinct from the others by the artistic elements brought to bear in the damasks, worsted, and mixed, which characterise the leading features of its display. The smaller towns of the West Riding are all subordinate to these four great centres; and under these heads they are arranged by means of fittings, glass cases, and other appliances as substantial as the Building itself. In short, there is a permanent look about the West Riding arrangements which conveys the idea that the manufacturers of that locality have settled down and established a regular cloth or market hall in which to display to all future time the products they undertake to supply for the use of their fellow men, both at home and abroad. These arrangements, too, have been in constant process of alteration and improvement, and it is now intended to mark each town by a distinguishing flag, and induce all the corporate towns of England, Scotland, and Ireland to contribute their heraldic buntings to enhance the display.

LEEDS.

As already stated, Leeds is the exponent of the woollen cloth manufacture of the West Riding; and, in the extensive contributions here displayed, the peculiar character of the materials for clothing which this district supplies to the markets of the world is well and successfully shown; for, whilst the West of England may be said to be almost exclusively employed in the production of cloths for the higher classes, the looms of Yorkshire may be said to be as exclusively employed in producing woollens for the million. The prevailing feature of the Leeds trade, then, is utility combined with moderation in price. As an exhibition, the appearance to the eye is more sombre than gay—the dark colours producing little contrast or effect in the arrangement. The most striking display, as a whole, is that of Messrs. Benjamin Gott and Sons. The large glass case projecting into the central avenue is devoted to the contributions of this house, and contains specimens of goods manufactured for the Russian, Chinese, American, and home markets. These show great brilliancy of colour and beauty of texture; and, manufactured as they are exclusively for large markets, may vie with any specimens of the same class produced in this country, or any other. Messrs. John Sykes and Son also send a beautiful assortment of woollen cloths, which may be considered as illustrating the ordinary manufacture of the Leeds district. Messrs. Pawson, Son, and Martin; York and Sheepshanks; Thomas Webster; Walter Stead and Co., and various other exhibitors, send some of the best specimens of the finest goods; whilst the display of W. Smith and Son, in pilots and beavers, shows to what an extent this class of goods are manufactured in Yorkshire. Messrs. Hague, Cook, and Wormald, and Messrs. William Yewdall and Son, show some excellent specimens of Spanish stripes.

Billiard cloths, which are extensively manufactured in this locality, are illustrated by Mr. Wm. Fenton; and John Wilkinson and Co. exhibit a great variety of felted cloths suitable for all purposes for which such material is generally used.

In camel's hair and in mohair-cloths, Messrs. James Walker and Co.; Edwin Frith and Sons; and Gill and Bishop, exhibit specimens of good quality; and, as these materials are now in general use for outer garments, the display is a valuable one, as the character of the manufacture is thus fairly illustrated, and an opportunity given for close examination of very beautiful materials both as regards use and appearance.

Messrs. Pease, Heaton, and Co.; T. W. George and Co.; and R. F. Green and Son, show a great variety of examples of stuff goods, in lastings, damasks, &c. These materials are extensively used for upholstery purposes in the larger patterns and coarser qualities, and for ladies' dresses in the finer and more highly finished kinds. In those useful articles, blankets and carriage rugs, there is a goodly exposition from the lowest to the very highest class of goods. These are contributed by Messrs. Hague, Cook, and Wormald, Thornton, Frith, and Co., and others. Nor must we omit to mention some very excellent silk warp cashmerettes by the last-named firm, manufactured chiefly for the American market.

Altogether the Leeds contribution leaves a good impression upon the mind of the careful observer; and though, perhaps, by no means so attractive to the general visitor as the more showy displays, yet to the merchant and manufacturer it conveys a large amount of information, and to our foreign visitors there can be no doubt it gives valuable hints as to future commercial transactions.

HUDDERSFIELD.

The contributions from this thriving town are of a more miscellaneous character than those of any other of the West Riding, and the illustration of its industry fitly commences with a carefully elaborated series of specimens of wool in the course of manufacture, and displaying in a most satisfactory manner the various processes from the raw material to the woollen cloth in a finished state.

This interesting contribution is arranged in a very admirably constructed glass case, placed by some mischance in a very out-of-the-way position at the back of the court. It is exhibited, together with a variety of excellent cloths, by Messrs. John Brooks and Sons, of Henley (86). The series commences with a specimen of assorted Silesian wool, and then follow examples scoured, wooded (a first preparation for dying), dyed black, willowed, and scribbled; then specimens of carding, slubbing, spinning into coppins for warp, and bobbins for weft, warped yarn, and then an example of raw thread or piece from the loom scoured to take out the oil added for the purposes of spinning and weaving after the finished dye. Then follows the balk or twilled cloth, the cloth raised, cropped, and ready for boiling. The same kind of cloth boiled and tentered; and, lastly, a specimen of finished cloth as

the connecting link between these processes and the cloths already quoted as exhibited by the same house, which are hung around.

This admirable arranged exposition is not in a mere flat glass case in which the specimens are so small as to be scarcely visible, but is displayed to great advantage by the mode of arrangement, and we cannot but regret that it has not been placed in a more prominent position.

Messrs. Hincheliffe and Son (93)exhibit trouserings, and Walker and Sons mohair cloths of excellent quality, dye, and finish, as also alpaca rough cloth, with a short-haired surface, in contradistinction to the other. Mr. Peter Shaw's (90) contribution consists of specimens of fine black cloth of excellent quality and finish. Armitage Brothers exhibit a general assortment of top-coat cloths, such as elephant beavers, weighing 45 to 48 ounces to the yard, made entirely of Australian wool; as also specimens of the cloth made according to the method already quoted, whereby the two sides are of different colours, and even of texture of surface. These are excellent examples of this peculiarity, as are also those manufactured of vicunna wool on one side and fine sheep's wool on the other, and exhibited by Messrs. J. and A. Bennett (95). The effective character of colour and surface in these specimens at once conveys the idea of a coat in which the lining and outer surface are sufficiently contrasted to produce an agreeable effect by contrast of colour and texture.

The fine cloths and black doe-skins exhibited by Hastings Brothers 100), and the livery cloths by Wrigley and Son, are noticeable for many excellent points. In the ordinary productions of the woollen trade. Messrs. Vickerman and Beaumont exhibit a general assortment of piece-dyed goods, together with corded trouserings, manufactured entirely of wool. Messrs. Lockwood and Keighley (104), too, display a superior quality of corded trouserings. The summer coatings exhibited by Mr. Schwann, manufactured by Milner and Hale, are noticeable for their admirable cloth finish; and Messrs. Barnicot and Hurst's examples of trouserings, of a quality in which it is usual to mix German wool, prove the value of our colonial products of this material, by showing that the latter may be successfully substituted for the former. The plain and fancy trouserings contributed by Charles Beardsell, are worthy of especial attention, not only for the excellence of their make, but for the tasteful character of the colourings.

Messrs. Isaac Beardsell and Co. (109) exhibit cloth coatings and fancy trouserings of good quality, together with top coatings, with the fancy linings already alluded to as being now manufactured so generally. A peculiar make of cloth for top coats is also exhibited by David Shaw, Son, and Co., the mixture being effected in the carding, by placing different coloured cardings or rovings together, and then carding again. This gives a certain irregularity of tint to the yarn, which, when woven and raised in a velvet-like pile, produces a very agreeable effect. Coatings of a beautiful quality for livery purposes are exhibited by Messrs. J. and G. Hinchliffe (119), as also by W. Willott and Co. (114), the latter also displaying specimens of very fine doe-skin cassimere, of a very superior quality.

Messrs. J. and T. C. Wrigley and Co. (117) exhibit an excellent series of top-coat fabrics suitable for Russian and Canadian wear. These have mohair backs, and are of great strength, thickness, and weight. In the latter respect some are 3½ lb. to the yard. These cloths present many attractive features to those who best understand them, but in the present warm weather they conjure up sensations of heat by no means seasonable as regards the general visitor. Messrs. Huth and Fischer (123) also exhibit similar goods, this house being the originators of these articles, and the proprietors; Messrs. Wrigley being the manufacturers. Those who have experienced the severity of a Russian or Canadian winter can best appreciate the value of a garment made of such dreadnought materials as these articles certainly are.

In dress goods, vestings, &c., Messrs. John Taylor and Son (111) display a varied assortment of the latter, the designs and colourings of which are generally very excellent, the cotton quiltings being also of a very superior character. The same may also be said of the quiltings exhibited by James Tolson and Sons (116). The dress goods exhibited by this house are also very good; and in addition to these there is a display of beautiful grey trouserings of a character well worthy of attention. The plain coloured cachmere vestings and clear white goods of the same kind exhibited by Mr. Jonathan Schofield, together with shepherds' plaid trouserings, are beautifully made, and remarkably even in texture.

Messrs. Joseph Norton and Co. display a selection of table-covers and shawls. The former are of coloured damasks, and are washable; being made of wool and cotton, with the occasional introduction of silk. The style is bold and effective, and the designs much better than is usually found in these articles. Some of the shawls are novel and effective. One in imitation of ermine is exceedingly ingenious in its mode of production, and the effect is elegant and pleasing. The trouserings of a chequed pattern, in cut plush, and shawls of the same character, are worthy of notice, as presenting features which might be extended to other classes of goods. The glove-cloths exhibited by this house are very excellent, and are composed of wool and a mixture of rabbit's down. The fabric is knitted by Claussen's circular loom, which is now attracting so much attention in the machinery department.

The most illustrative general display of the manufactures of the Huddersfield district is certainly that of Mr. F. Schwann (115), who has been at much pains to give a full and complete epitome of the class of goods usually produced for the ordinary markets of the world, rather than to exclusively illustrate the higher class of productions. In the exposition thus made we find excellent productions of each class. The woollen and cotton figured vestings, as also those in silk and cotton, are all of a very noticeable character; some indeed are excellent alike in design as in manufacture. The cotton quiltings, too, are very superior, being tasteful and appropriate, especially in colour. The Ponceau mohair mantilla cloth, in a variety of shades, presents great excellences of manufacture and finish; and the Angola wool and cotton-chequed pantaloons possess many points which will render them interesting to buyers for their admirable qualities, alike in the more ordinary as in the higher examples.

As an illustration of the direction which certain branches of manufacture take in the West Riding of Yorkshire, we may quote the examples of tweeds manufactured without wool; that is, made of woollen waste—a material which the ingenuity of the manufacturer alone can render at all valuable. For this purpose the refuse of other departments is collected together; and we have here, exhibited by Messrs. Oldfield, Allan, and Co., examples of tweeds made entirely of waste. It is by this economic use of the apparently useless material that our manufactures flourish in many of the more extensive departments; and when used legitimately, with a full understanding as to the true nature of the manufacture, and not, as is too often done, as means of adulteration—if we may use that term—he must be a very fastidious being who would object to its employment in the production of articles to which it is really suited.

BRADFORD.

The manufactures of Bradford display another phase in the character of the industrial productions of Yorkshire; and, as the leading feature of Leeds is the woollen trade, so that of Bradford is the worsted or stuff trade, together with all those recent novel introductions such as alpacas and mohairs. The distinctive difference between the woollen and worsted trades is but little understood, yet they are certainly as distinct as—indeed, more so than—those of flax and cotton. Woollen manufactures are produced from the same general material as the worsted, but the kinds of material are essentially different—the shorter quality of wool being used for the production of woollen cloth, and that of longer staple for the production of worsted or stuff goods. The machinery employed in the spinning, too, is as different as that employed for the long fibre of flax and the short fibre of cotton; and, whilst the woollen cloth has to undergo a variety of operations after it has quitted the loom, worsted fabrics are in a comparatively finished state, being merely in need of a final dressing, as a finish to the texture, or rather of the surface. The different length of staple in wool is, of course, adapted to the various kinds of worsted by the skill of the spinner, and the material for stuff goods or for hosiery is selected accordingly; so that the worsted trade is again sub-divided into two distinct classes of manufacture.

This brief explanation may be sufficient to show that, in now treating of worsted goods hosiery is not to be considered, but simply those articles which belong to the garment or furniture trade. Of the former, we may have worsted in its integrity; the same with cotton, silk, or other material as mixtures, together with mohairs and alpacas, plain and figured—of the latter, damasks, moreens, lastings, and other fabrics, either decorated or not. The various names by which many of the mixtures are called, are merely fanciful, and really have no reference to the nature of the material. Thus, while the terms merino, *mousseline de laine*, *mousseline de soie*, alpaca, or mohair, are names descriptive of the materials of which the fabrics are made, those of Orleans, Cobourgs, and Princettas are merely commercial terms to distinguish one mixture from another.

By far the most extensive exhibitor in the Bradford department is Mr. Titus Salt, and he has certainly been at some trouble to give as complete an idea as possible of the peculiar trade of the district of which Bradford is the centre. Mr. Salt's display consists of chenés, alpacas with satin stripes and silk figures, in which there is much taste and skill displayed. The shot alpacas, being a mixture with silk, are very beautiful and effective specimens of manufacture. In furnitures, Mr. Salt's moreens command attention from the beautiful character of the varied dyes and their watered effects.

In the front of the portion of the court devoted to Bradford, a very handsome glass case with polished mahogany frame-work is placed, corresponding to the one already noticed in the Leeds department, as appropriated to Messrs. Gott. This case is very judiciously devoted to the exposition of a selection of the best goods from Bradford, as contributed by four manufacturers. Mr. Salt shows an epitome of his more extensive contribution, whilst Messrs. J. G. Horsfall and Co. (174) display Cobourgs, and plain coloured goods of super-Saxony wool, all of an excellent quality and make. Messrs. Rand and Sons (173) show merinos and Cobourgs, single and double-twilled, and very fine. The varied coloured Henrietta cloths, of silk warp and worsted weft, are also of the finest twill. Messrs. W. Milligan and Son have, in addition to a large display at another point, a pleasing collection of imperial alpacas in figures and stripes. The effect of the "embroidered" alpacas of this house, though the term is sadly misapplied, is so excellent, and the mode of production so skilful, that we are almost tempted to give a description of the process. Bradford, then, may be proud of the display in this one glass case, the combined effort of four of its manufacturers.

Messrs. Schwann, Kell, and Co. (141) make a very valuable display of the various classes of goods which they, as merchants, bring into the markets; and the illustration given of the peculiar trade of Bradford is as complete as that already alluded to as being the exponent of the manufactures of Huddersfield; and Mr. F. Schwann being the principal of both houses, there is an uniformity in the arrangements which adds to their value. In each exposition a distinct catalogue is printed for the use of those directly interested in the articles exhibited.

Messrs. A. Tremel and Co. (147) exhibit a great variety of alpaca and mohair mixtures, and silk figured brocades, of an effective and excellent character. The specimens of dying in the piece, with silk and cotton warps, sateens, and Brazilian cloths, contributed by Messrs. George Armitage and Co., (146) are also very admirable. In all probability, however, the most excellent goods of their class are those exhibited by Mr. Jacob Behrens (180), and manufactured by Messrs. Bottomley, Wilkinson, and Co. They consist of an excellent display of figured goods, imperial sateens, &c, of first-rate quality in dye and finish. Messrs. Moses Bottomley and Sons (165) also exhibit silk-figured mohairs of an excellent character, and an example of a novel robe skirt, in which the design is applied to suggest flouncing, the effect being good as a whole, but somewhat confused in the arrangement of the parts. The weaving, however, is first-rate. Messrs. W. Ecroyd and Son (130), of Burnley, exhibit a variety of fabrics of good quality, the Cobourgs being very excellent.

It would occupy too much space to go over the whole of the very excellent contributions from Bradford, but the importance of the yarns now demand special attention; we must therefore dismiss the piece goods by the general remark that Jonas Sugden and Brothers (167), T. Jowett and Co., of Bingley (144), Foster and Son (143), and George Rogers (142), and others all exhibit goods of a very superior quality in many points. The first-named of these houses display a peculiar kind of goods, manufactured for Italy and Spain, and used in those countries for the dresses of monks. These are "says" of all wool. They also show another variety known as "union says," a mixture of wool and cotton. In the compartments devoted to these goods are some excellent summer coatings, and a glass case containing specimens of 800 varieties of Genappe yarns used in the manufacture of poplins and small wares, as also for a great variety of fancy articles.

The worsted yarns of Bradford are famous wherever the manufacture is carried on, and a very interesting display is made by various spinners of the peculiar character of the various kinds used in making the goods we have been noticing. Messrs. J. Rand and Sons contribute a case containing examples of the spinning processes of worsted yarns. The specimens are very beautiful; and, whilst the ordinary numbers are from 30 s to 50 s, we find in this case examples of 120 s, 130 s, and even 160 s, which, in a material like wool, is certainly a great novelty. Mr. William Chesseborough displays a very tastefully arranged assortment of specimens of wool grown in the various counties of the United kingdom, as it comes from the fleece; and Messrs. W. Millegan and Son give illustrations of the preparation of alpaca wool from the fleece to the cloth, with assorted natural colours; and a beautiful example of the operations by which these colours are mixed to gain one uniform tint. This display is completed by a series of examples of alpaca mixtures. Other houses also exhibit specimens of mohair and alpaca yarns; Messrs. Harris and Fison showing examples of rabbits' down cloth, spun and manufactured entirely from that material; and, from calculations made upon these experiments, there is every reason to suppose that this will become useful in an economic point of view. The Berlin wools, manufactured and dyed in England, and exhibited by Messrs. Quitzow, Schlesinger, and Co., are good examples of this class of manufacture.

As a whole, the Bradford contributions are most excellent; and representing, as they do, a trade of such an extensive and world-wide character, too much importance cannot be attached to the manner in which the manufacturers of this flourishing town have come forward to sustain their own interests and the manufacturing dignity of this country in that department to which they devote their skill, industry, and capital.

HALIFAX.

The leading feature of the Halifax display is its decorative character, the great proportion of the goods being either for furniture purposes, such as damasks of various kinds, moreens, and table-covers, or intended for the South American markets, where gaiety of colour and striking effects are in request as an element of manufacture. The contribution of Mr. J. Wilson (138), of ponchos, mantuas, and shawls, will best illustrate the peculiarities of this class of goods. These contrast in a remarkable manner with those articles intended for our own domestic purposes. Messrs. Hoadley and Pridie's (128) display, for instance, shows this point very clearly. In these examples the patterns are bold and effective, and generally in good taste, the self-colours being very excellent in dye and finish.

Mr. W. Brown (129) exhibits some neat and effective patterns of the same class. The silk, however, is so sparingly introduced as to give a thinness of effect to the parts where it is seen. Messrs. Shepherd and Perfect (131) also exhibit some good patterns in worsted damasks; but the character of the table-covers is not precisely what it might be, the designs being more clumsy than elegant. Mr. J. W. Ward's (134) furniture damasks, striped in the warp, are very superior in design and effect, and altogether his display is a tasteful one. In Mr. H. C. M'Crea's exposition there are two or three very excellent examples of the furniture class, as also specimens for the South American market of the usual effective character.

After looking at the gay articles around, the contribution of Messrs. Clay and Sons (136) strike by the contrast they afford, being chiefly jacket cloths for cricketers, ironing blankets, and blue flannels.

The display, too, of Messrs. W. Barraclough and Son is peculiar in its character, being an assortment of druggetings, linseys, &c. The contribution of Messrs. Ackroyd and Son is, however, the most extensive display of the manufactures of Halifax, particularly in ladies' dresses, which are especially neat and tasteful, and of excellent quality. These are chiefly merinoes, princettas, and goods of a similar class. The damasks, too, are bold and effective alike in design and colour. Messrs. Aked and Sons show another class of goods—pantaloons, mixture coatings, and fancy cheques—and these are excellent of their kind, in colour and quality.

We have thus gone over the whole of the productions of this important district at greater length than was originally intended; but the examination of its various excellences, the important interests at stake in connexion with its wide-spread commercial connexion, the efforts made by the manufacturers of the West Riding to give full effect to the Great Exhibition by good and truthful examples of all they could do, demanded that every attention should be paid to the result of those efforts; and we are perfectly satisfied that no unprejudiced mind can look upon this display with anything but satisfaction, since, in spite of all sorts of sneers and inuendos about base imitations of superior goods, the deceptions practised in the manufacture of cloth; all too true in many instances in the ordinary course of trade, we have here such a proof of the capabilities of the manufacturers of this great district, as to show at once of what they are capable, and which will tend to place them in an infinitely better position than they have ever held before in the estimation of those most interested in these productions.

Our notice of the woollens of the West of England, and the mixed fabrics of Scotland and Ireland, together with the foreign contributions of the same class, must be postponed; but we commend them to the serious attention of those visitors whose pursuits are of an analogous character, as likely to afford many useful and important hints as to methods of production and style of finish.

MINERAL FUEL.

THE visitor arriving at the Exhibition Building from the west, or passing out from that extremity, will not fail to be struck by a number of large objects there collected and arranged, amongst which some gigantic blocks of coal are not the least remarkable. These form part of a noble series of specimens of mineral fuel, most of them, as might be expected, the produce of English mines, and capable of giving to the general observer, as well as the practical man, a most valuable idea of the relative as well as positive importance of this source of our country's wealth. We propose to detain the reader a little in the consideration of this subject, as one worthy, from its general interest as well as its importance, of special notice on the present occasion.

Mineral fuel exists in various ways in the earth, if by this term we include, as we may fairly do, all those deposits in any sense available for fuel which form now an essential part of the earth's external layer or surface. Using the expression in this general way, we understand it to mean peat and turf, as well as coal; and not only such coal as is brought to us from Newcastle, Lancashire, Yorkshire, South Wales, or other places in the great coal districts of the north and west, which chiefly supply London, but the less perfect and much less valuable material obtained in other countries and other places, and known technically as lignite, or brown coal.

Peat, like all other supplies of fuel from the earth, is nothing more than vegetation of some kind in a more or less altered state. When, owing to any cause, the decomposition of dead plants is checked or prevented, a gradual and steady accumulation takes place; and, where circumstances are favourable, this is much assisted by a particular kind of moss, making, with the other plants, a spongy semi-fluid mass, which gradually increases till the magnitude becomes as large as the condition of the surrounding ground will admit. From 12 to 20 feet is no uncommon depth for such material; and so great is the surface extent, that not less than one-seventh part of the whole of Ireland is thus occupied. Anything which could render this peat available as fuel at a price at all competing with that of coal, would, unquestionably, be a great advantage to a country like Ireland, and also to many parts of Germany; and several such methods have been adopted, which are illustrated in the general collection in Class 1. We may refer here more particularly to the preparations by Mr. Jasper Rogers, and those by Mr. Evans (Stone's patent), and Mr. Cobbold—the latter effected, we believe, by centrifugal force without pressure and while the material is in a pulpy state, and certainly yielding some very curious material resembling jet, and capable of being turned in the lathe. Mr. Evans exhibits chiefly the numerous products obtained by the destructive distillation of peat, the economic value of which does not at present seem very distinctly proved, but which are well worthy of experiment; while the interest excited by the products exhibited by Mr. Rogers has a wider range, as it is connected with large sanatory questions and the employment of peat charcoal for manure.

The great objection to peat as a fuel has generally arisen from the large quantity of water which it contains even when it has been exposed to the ordinary process of drying. This air-dried peat, even under favourable circumstances, contains no less than one-fourth part of its weight of water, and in any use of the substance as fuel, the first thing that has to be done during combustion is to turn into steam and drive off by evaporation this extraneous moisture. In charring peat the result of the water is seen in another way; for as it is present chiefly in the little cells of the plants of which the mass is made up, the charcoal produced is very light and easily reduced to fine powder, just as would be the case if leaves, twigs, and mosses were burnt. The very light and porous state thus obtained is unfavourable for the use of the fuel in cases where great heat is needed, and where a blast of air is employed. All these objections to peat and charred peat are, however, much diminished, and even removed, when the peat is reduced to a more compact substance, and the water got rid of. By some contrivance the weight of such prepared fuel is greater than that of a similar block of coal, and the charcoal is more dense than that from wood. When we consider that in Ireland, as we have already said, not less than one-seventh part of the whole surface of the country is covered by bog, while coal, though it exists, is dear and not very good, the vast importance of the utilisation of peat will be at once appreciated. With regard to the relative value of peat and coal, it may be sufficient to say, that 1 lb. of ordinary peat will evaporate 4¼ lb. of water; 1 lb. of perfectly dry peat will evaporate 6 lb. of water; 1 lb. of Newcastle coal will evaporate 7 lb. of water, and 1 lb. of pure Welsh anthracite as much as 10½ lb. Compressed peat varies in this respect according to the method adopted to bring it into a convenient and valuable form.

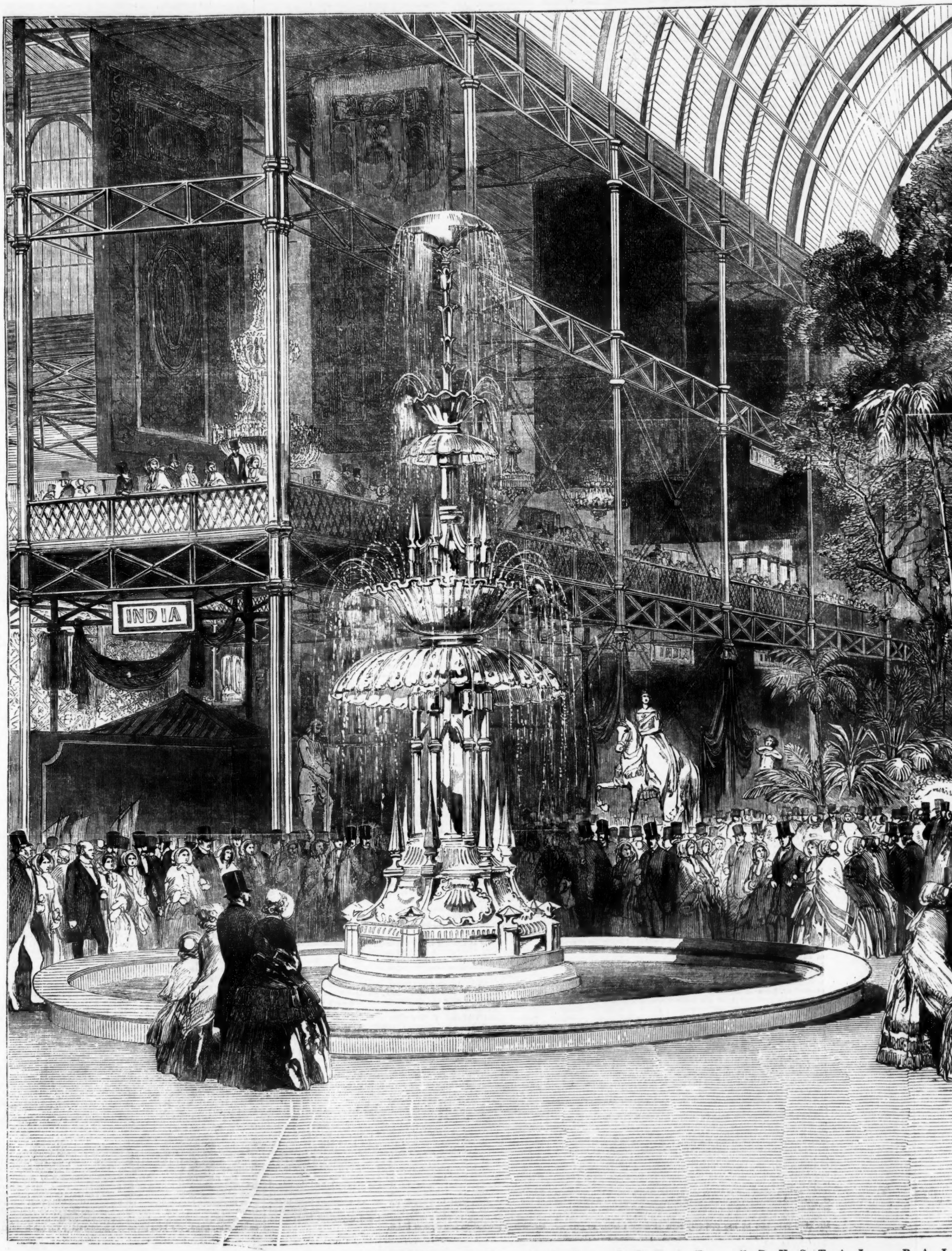
There is a form of mineral fuel of which we have but few and unimportant examples in this country, but which is incredibly abundant in several parts of the Continent where coal is comparatively rare. This material is called *lignite*, and consists, generally, of large accumulations of trunks of trees, heaped together in particular places to a thickness of 40, 50, 100, or even 200 feet, and occupying sometimes a considerable space. Even in Ireland, on the shores of Lough Neagh, this substance exists in three beds, having a total thickness of 60 feet, and extending over 100 square miles, so that its economic value is really very considerable. At Bovey Tracey, in Devonshire, similar beds exist, but of smaller size, and these are actually worked, the lignite being used in some potteries in the neighbourhood. The value of lignite as fuel has not yet been appreciated, as there are some important practical difficulties in the way of its use connected with the presence of water and earthy impurities. There can, however, be no doubt, that before long these vast stores will be rendered available, especially where, as is the case with Austria, they exist in the immediate vicinity of supplies of iron ore, practically inexhaustible. Those interested in examining material of this kind will find amongst the foreign goods some samples of lignite as obtained from Moravia and Styria, and used in Vienna.

Coal differs essentially from peat and lignite in having its minute cells either occupied with a gas instead of water, or so completely obliterated, that nothing remains but carbon and a very small percentage of ash. There are several different kinds of coal dependent on this condition. Thus, amongst lignite, it is not unusual to find black brittle bands like jet, and jet itself is but another name for the same thing. The vegetable matter in this state contains much gas, takes fire readily, and burns like wood steeped in resin, with a bright flame and smoke. It is clean, not soiling the fingers, and is very brittle. It is the step intermediate between lignite and coal, and when in sufficient quantity, and not too brittle, is often worked into ornaments under the name of jet. Some good examples, both of the raw and manufactured material, will be found exhibited by Messrs. Slater and Wright in Class 1, and are worthy of notice. Jet, however, has been too long known as an ornament, to require any especial notice, except to connect it with coal as the substance with which it has the nearest relations.

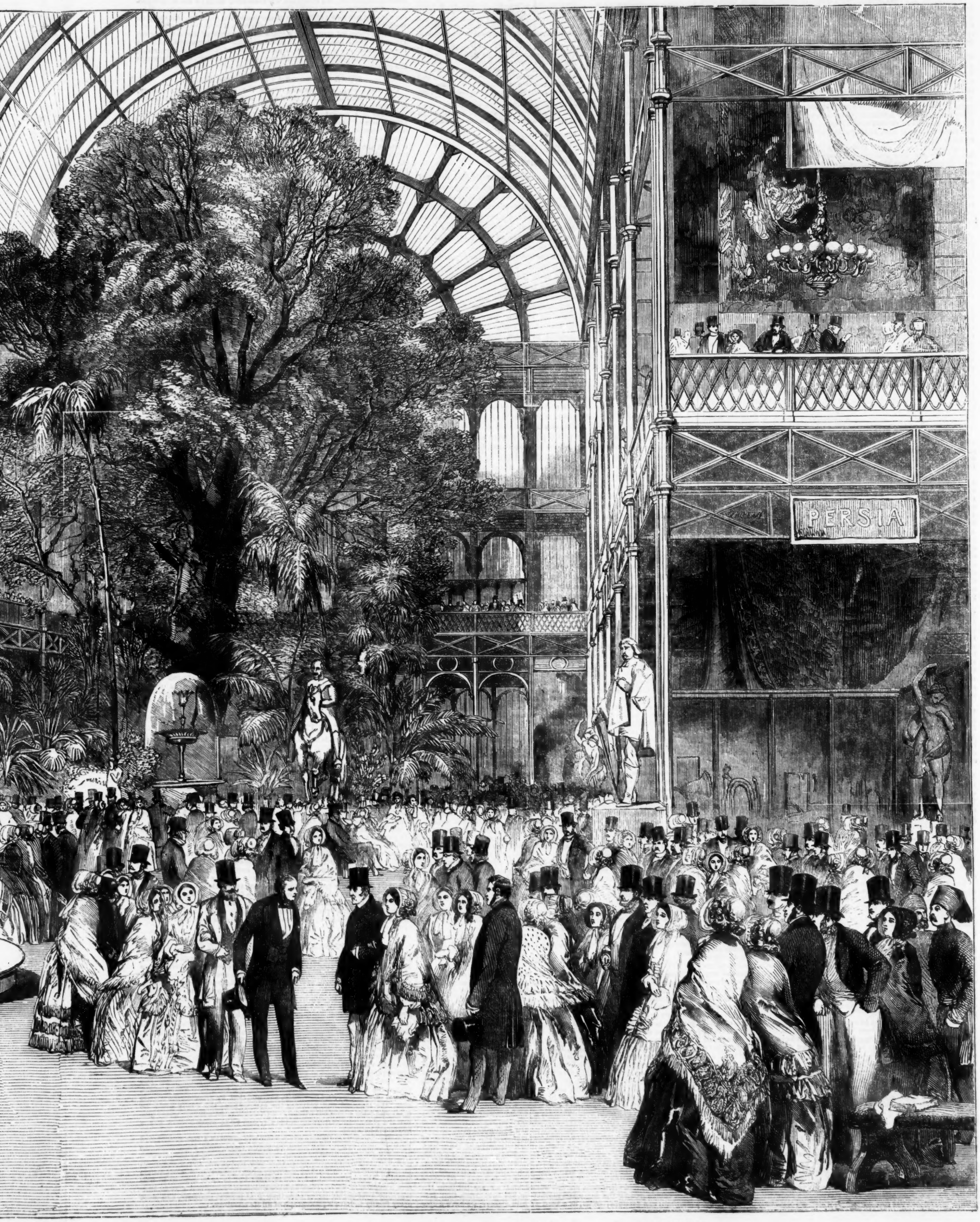
The next step is the progress of vegetation towards the mineral kingdom is seen in cannel or parrot coal, which contains about 50 per cent. of volatile matter; and, like jet, can be worked up into various ornaments, as may be seen by the beautiful specimen exhibited by H.R.H. the Prince Albert in Class 27. There is there a garden chair, which well shows the nature and capabilities of the material, and a block of the raw material is placed near for comparison. In Class 1 is a model of the Durham monument, and a number of smaller objects constructed of the same material.

But cannel coal is not only useful for ornamental purposes. It has a far more important value in the very large quantity of common street gas that can be obtained from it, and the excellent quality and great purity of the gas. There are large deposits of this material in Scotland, where it has been used for some time by the gas companies, but it has not long been employed to any great extent in London. Now, however, there is found to be a supply obtainable from the Newcastle coal district, and this is used exclusively by the Western Gaslight Company. There is also a large quantity used in London obtained from the Wigan coal field, where a thick bed is being worked to very great advantage. Specimens of these two kinds (Russell's Newcastle and the Ince Hall Wigan cannel) may be seen amongst the general series of coal in Class 1.

Next to cannel coal, the common bituminous coal of Newcastle and other districts is the most remarkable for the quantity of gas it contains. It is the common household coal in most parts of England; and, as it takes fire readily, burns freely with considerable heat, has a cheerful appearance, and is of moderate price, it is likely to retain its reputation. There are two kinds of bituminous coal, the one swelling and becoming compact while burning, as the common caking coal obtained from the north; but the other, although containing as much volatile matter, and therefore equally fit for gas-making, remaining unaltered in form while undergoing combustion. The non-caking kinds come chiefly from the inland coal-fields, and are easily distinguished from the others. Generally speaking, the disadvantage of the Newcastle coal is that it requires constant stirring to keep a draught of air through the fire; but, on the other hand, the heat given is considerable; the ash is small and



INTERIOR OF THE GREAT CRYSTAL PAL



L PALACE.—THE TRANSEPT, LOOKING NORTH.

red, or at least, dark-coloured, and the coal readily takes fire. The midland coals do not require stirring, but they burn with much fine white ash, and are not so profitable where strong heat is needed.

Within the last year or two, very large quantities of coal have been brought to London by railroad, from various inland coal-fields, and the estimation of the older and longer known kinds has undergone some change; but the general feeling still remains that the best Newcastle coal is that best adapted for use amongst English families in London and its neighbourhood.

When coal contains so small a proportion of gas and volatile ingredients, that it cannot be used with advantage in the manufacture of gas, it may still have a value for other purposes, which may render it very useful and important. This is the case with the kind called *steam-coal*, rarely seen in London, but of which there are some noble examples in the Exhibition, and remarkable as making hardly any smoke, lighting readily, and burning with intense heat. The more important of these coals come from Wales, and contain upwards of 80 per cent. of carbon. They are especially useful for the steam navy, and are now employed for that purpose to an enormous extent. They are also most valuable in the manufacture of iron, as they stand the blast, and contain few or no noxious ingredients.

Anthracite is the name given to a peculiar kind of coal containing hardly any gas, and consisting almost entirely of pure carbon. It is very difficult to burn, but, when once fired, gives off intense heat, and stands a blast perfectly, being thus well adapted for stoves and for the manufacture of iron. It is heavier than common coal, often hard, and bright, and with a shining irregular surface. It exists abundantly in South Wales and North America, but occurs also in Ireland and on the continent of Europe. Besides iron smelting, it is especially adapted for malt-drying, hop-drying, lime-burning, and other purposes where smoke is injurious.

Of all these different kinds of mineral fuel, the Exhibition yields admirable examples, not only from our own country, so rich in this source of a nation's wealth, but also from distant countries, who have cared to show in what way they can enter into the field of rivalry with us. There cannot be a question that the foundation of our national importance is based upon the natural resources of this kind that we so abundantly possess, and it is both interesting and useful to see this recognised in the efforts that have been made to illustrate sufficiently the different districts most remarkable for their coal in our own island.

Of all these, the great district in Northumberland and Durham, which for a very long period has had the entire monopoly of the supply of coal to the east and south coast and many of the large towns of the interior of England, must be considered the first in the extent and scientific character of its workings, if not in magnitude. This tract occupies half a million of acres, and has been estimated to contain not less than ten thousand millions of tons of coal, of which, probably, an eighth part has been already removed. It is illustrated in the Exhibition by a considerable and interesting series of the different qualities of coal, the coke obtained from the coal, the clay on which the coal reposes, and which is valuable for various purposes in the arts; and also by the various maps, plans, and diagrams illustrative of the district and the mode of obtaining the coal. Several models are also exhibited which will render still more clear the method of obtaining this mineral from the bowels of the earth, and the contrivances necessary to supply a sufficient quantity of fresh air to the men employed underground.

The Lancashire coal-field is remarkable for its influence on the great manufacturing towns of Manchester, Bury, Wigan, and others; and the great Yorkshire coal-fields, on which are Leeds, Sheffield, Halifax, Bradford, Huddersfield, and many other large and important towns, are also illustrated by the specimens of produce referred to this department.

From the Wigan coal-field, which is actively worked, and which supplies the cannel coal, already referred to as exhibited by the Ince Hall Company, we have also two kinds of household coal of excellent quality outside the Building, and some samples in Class 1. From Manchester there is at present no series; but on the Yorkshire side coal has been sent from Barnsley, illustrating very well the importance of the deposit and the nature of the supply. Several exhibitors have sent from this locality, and the group is both interesting and useful for the purpose of comparison. Two columns of coal in the Building, and one outside, sufficiently show the quality of this coal; while one exhibitor has erected a column of a peculiar variety, called sometimes "peacock" coal, which presents a display of colours more like the tarnish of some metals than the ordinary dark and gloomy surface of coal. Whilst speaking of the coal of this district, we ought not to omit mention of the Stavely block of coal, from a mine near Chesterfield. This block is estimated to weigh not less than 24 tons.

The South Staffordshire coal-field, containing one seam or bed not less than 30 feet thick, is also abundantly illustrated in the collection. In the western enclosure (outside) is a column showing this vast thickness in the way in which it is presented in nature; and the magnitude of the mass is also further illustrated by two blocks, one weighing nearly 10 tons, and another 15 tons—one exhibited by Mr. Round, and the other by Mr. Haynes; the latter being interesting in reference to the vast mechanical power required constantly in a large colliery, as this single block, weighing, as we have said, 15 tons, was actually removed from the bed of coal, conveyed to the pit bottom, lifted to the surface, and deposited on a truck by the machinery in daily use at the mine, and without any special contrivance or extra force.

The South Welch coal-field is that which contains the greater part of the steam coal and anthracite found in the British islands, and is well illustrated by several varieties of each exhibited on a large scale. It has been estimated that the district occupied by coal in Glamorganshire and neighbouring counties must contain nearly a hundred thousand millions of tons—a quantity so large that it is hardly possible to imagine any consumption that shall seriously affect it within any time that man can look forward to.

The steam coals described as "Russell's," "Risca," "Nixon's Merthyr," "Powell's Duffryn," "Llangennach," and some others of which there are specimens, are all well known, and greatly employed in our steam navy in different parts of the world. Many beautiful and valuable anthracites are also to be seen, some presenting a peculiar polish, and others remarkable for their want of smoothness and face; but all of good quality, and capable of wide application.

There are several specimens of coal from North Wales, which are also interesting. The most remarkable of these are the gigantic block, exhibited by Mr. Oakeley, and said to weigh 16 tons; another large block of 12 tons, from the Brymbo Company. Both are fine specimens and illustrate the Flintshire coal-field, which, however, may be regarded as a portion of the Lancashire, though obscured and covered up by a very great thickness of the new red sandstone.

Some specimens will be found illustrating both the Scotch and Irish coals; amongst them the parrot coal already alluded to. We may also refer to an interesting series illustrative of the coal-field of Mid-Lothian, exhibited by Mr. Cadell; and some Irish coals, though in less variety than might have been hoped. Lastly, we may refer to the anthracite or culm obtained from Bideford, in North Devon, which is exhibited together, with some of the products obtained from it.

Amongst the foreign coals the Belgian series affords the principal points of interest, not so much for the extent of the coal-field as the great relative importance of the production. The coal area does not include much more than a quarter of a million of acres, but the annual production is at least five millions of tons, exceeding, therefore, that of any other country in the world except Great Britain. The specimens of coal sent for exhibition are interesting, and of fair size for comparison with our own, but do not, of course, present the thickness of the bed, or sufficient dimensions to observe the peculiarities of the different parts near the floor or roof of the mine.

Next to Belgium, Austria has sent the most interesting series of fossil fuel, but the variety is not very considerable. The States of the Zollverein and the Peninsula (Spain and Portugal) have contributed a small but not uninteresting quota, while France and the United States have also added to the stores. In these countries, however, the coal itself not occupying the important position that it does with us, as the source of all wealth, has not been forwarded in large quantities, or in great variety; and the same must be said with regard to our Indian possessions, which, however, possess several deposits. From New Zealand and Van Diemen's Land specimens appear, and also from Western Australia and some of the islands of the Indian Archipelago; but it is remarkable that the Newcastle of the southern hemisphere, though rivalling our own coal metropolis, not only by assuming its name, but supplying for New South Wales a considerable quantity of fuel, has not sent any sample to represent it in the great gathering of raw material we are now studying.

Besides the natural fuel supplied by coal, we have also forwarded for examination, chiefly on the British side, a number of samples of artificial fuel, of which the best kinds are made from coal-dust, and partly charred. These are valuable, as giving fuel of great density and high power in a comparatively small space, and will be valued accordingly wherever space is an object. They are generally constructed of the fine powder of coal and the smaller lumps, which are otherwise of little value.

In concluding these remarks on the subject of Mineral Fuel, we take advantage of what has been said on the subject in the bulletin of the Central Commission of Statistics in the kingdom of Belgium:—

This is essentially the age of commerce and steam, the foundations of which are our *coal-mines*. Thus coal produces steam; steam fashions the metals which serve to fabricate machines. The implements of various trades, leaving the workshops, are distributed through every branch of industry. Steam becomes the universal agent; if she is the producer, she is at the same time the vehicle of production.

The powers of man are centupled: he is no longer the serf of creation; he is rather the King. The Barons of feudality have made room by their side for the nobility produced by industry. The sword commands no more: it is capital which commands. To the state of strife, of warlike antagonism, succeeds a *régime* of industrial competition, and of exchanges. Men know themselves and each other better; national characteristics are obliterated; it seems that humanity is invested with a new form; organisation is established between states and between continents.

Mineral and metallurgic industry is, with agriculture, the most vital element of a country's prosperity. Coal is the most essential agent of all industry: the foundry, the iron, constitute merely the instruments, the elements of riches.

WALKS IN THE GALLERIES.

A FEW CURIOSITIES.

In resuming our exploration of the galleries, we no longer find nooks of solitude; the shilling admission fee has let in a crowd of eager provincials and acute town-bred mechanics, besides armies of boys and girls, who are not content to lounge down the main avenues, eye-glass in hand, to see and be seen, but conscientiously take out their money's worth in passing every zigzag of the eighteen acres of counter-room. Far from diminishing, this constantly varying multitude of eager investigators adds very much to the pleasure of the scene.

We will begin where we paused in our last notice, at the organ in the Western Gallery, at the end of the Nave. The walls are hung with models of ships-of-war, contributed from the Royal Dockyards, from the yards of the Messrs. White, of the Isle of Wight, and many who other private builders have successfully competed for Government work.

Referring our readers to an article upon the subject of Naval Architecture generally, which appears in another part of our paper, we are attracted by a singular broad-built craft, and find that it is a model of Noah's Ark, constructed to scale, from the description in the Book of Genesis; that is to say, "six breadths for the length and ten breadths for the depth," which the exhibitor asserts to be the proportion which experience has proved to be most suitable for our largest steamers.

Another curiosity close at hand is a model of a submarine boat, driven by a screw-propeller. The shape is that of a broad-backed carp, and the inventor proposes to make it sink under water, swim any distance, and rise again, at the will of a crew bold enough to trust themselves in this moving diving-bell. As his description is somewhat of the vaguest, we should not pay much attention to his plan, if it were not that Captain Johnson, the celebrated smuggler, who was no theorist, but an individual of an essentially practical character, had planned to rescue Napoleon Bonaparte from St. Helena, by aid of a submarine steam-boat, and was only prevented from making the experiment by the death of the captive. It would be absurd, after the triumphs that science has achieved in this century, to say that it is impossible to travel from Dover to Calais in a submarine boat; but we shall have more faith when an experiment has been exhibited, even on a small scale in one of the tanks in the Exhibition.

Not far from the submarine boat, keeping guard as it were over the Western Gallery, stands what looks like a man in armour, capped with a steel helmet; but the errand of this effigy is rather peaceful than warlike, rather meant to save than to destroy. It is composed of the complete and improved accoutrements for diving and working under water. Caoutchouc, in this as in so many other instances, has been found a valuable material for pipes to convey air to, as well as to form impervious clothes for the men who undertake to explore and raise treasures from wrecks, to lay the foundation of deep-water piers, to examine the bottoms of ships, and other difficult duties of the same character. All the appliances for the business of a diver are arranged alongside the figure. We believe similar paraphernalia form part of the regular stock of all contractors for deep-sea works.

Hanging from the ceiling, and taking rank with the submarine boats, are inflated models for guiding balloons. On a table under them are several contrivances for assisting swimmers—some not without merit. *Clayton's swimming gloves*, which form webs for the hands, and ingenious and unobjectionable contrivances for adding to the power of the feet, by presenting a broad surface to the stroke, and feathering, as it were, on the return would be very unsafe in practice, because the swimmer would be unable to walk in them, on reaching shore, without a tedious process for unfastening such artificial fins. If such things are required at all, they would be better affixed to the ankles or knees.

After the swimming contrivances, we reach a vast collection of models of life-boats, the greater number of which have been produced in consequence of the Duke of Northumberland having offered a prize of £100 for a life-boat to be used on the coast of the county from which he takes his title.

Life-boats should be of two kinds, for two qualities are required of them which are incompatible in the same craft. Passenger-ships should be compelled to carry boats, or the component parts of boats of buoyancy sufficient to sustain a great number of individuals in the roughest sea. But the life-boat required on a dangerous coast must be light enough and handy enough to be moved about from place to place with ease, and launched through surf in the teeth of a gale blowing on shore. It is obvious that these qualities are incompatible with the power of carrying a great number of passengers.

Among other articles exhibited for the benefit of the yachting community, is a cork hat, which the inventor recommends on the ground that it is not only capable of supporting a man in the water, but calculated "to form, on an emergency, an *excellent washing-basin*." Amid the costly complicated contrivances for assisting swimmers, we do not see one of the simplest and best—a cork collar, with an India-rubber joint. We can strongly recommend it to those who have to learn to swim in deep water. Unlike cork floats and air-bags, it is safe, without impeding the motion of the arms.

On the same table with the life-boats is a model of Sir William Snow Harris's lightning conductor for ships, which has been adopted in the navy

FIRE-ARMS.

Turning round the organ, we reach the British collection of fire-arms arranged in the south-western galleries, of which some notice appeared in our last Supplement. The division is specially marked by four life-size figures, with characteristic wax faces, of British infantry of the line, placed there to exhibit the contrast between the present and Mr. Bentley's proposed mode of slinging the knapsack. Mr. Bentley, from his placard, is very much in earnest on the subject, and seems to have common sense on his side, but it is hard to move constituted authorities. The veteran sportsman writer on guns, gunnery, and an enthusiast on the subject of wildfowl shooting, Colonel Peter Hawker, has not only sent a famous stanchion gun, which loads at the breech, and balances so nicely that a finger touch is sufficient to adjust the aim, but a very neat model of an improved punt, the result of his experience for a quarter of a century, in which, armed with the said gun, and clothed in the various garments, for a list of which his book must be consulted, on the most keenly freezing nights, he has been in the habit of paddling out on the south-west coast, and slaughtering ducks, teal, widgeons, wild-geese, and even wild swans in hecatombs. There is a peculiar interest in seeing the handiwork of this Nestor among sportsmen; because he handles the gun, the gunmaker's tools, and the author's pen with equal skill.

Among the guns, one case from Birmingham presents an epitome of the trade. No. 1 is a common flint musket with a stained beech stock, sold wholesale for about a dozen shillings for the African trade. It is a much better article than what used to be made in the old slave-trade days, African musket is the zero of a respectable manufacturer. By steps improvements and ornaments are introduced, until we are led from the plain double gun for the American market to the best article that Birmingham can produce; while, as a kind of *hors d'œuvré*, we have a specimen of a Californian protector, a neat double-barrelled carbine with a bayonet. It is not, however, to be compared for efficiency with Colt's revolvers, exhibited in the American section, which, from one barrel, without reloading, can discharge six successive shots by the simple process of re-cocking each time. But we must not pause longer with these details; we are now guiding the visitor round the galleries. An essay on the fire-arms exhibited by all nations will form a separate paper.

Contrivances for preventing accidental discharges of fire-arms are exhibited in great number, all ingenious—some too ingenious. Among the curiosities are a cross-bow of great power, with india-rubber strings, to fire a ball or arrow, and an air-gun of a new construction, in which the operation of cocking compresses sufficient air for one discharge.

DUMB WITNESSES OF OUR COMMERCE.

Our next step, still pressing along the extreme southern gallery, carries us from specimens of the arts of war to examples of the results of peace and the courage of commercial enterprise.

We are in a department of an important raw material. An enterprising firm of Leeds displays, in the convenient form of octavo volumes, neatly lettered, specimens of almost every kind of British and foreign wood used for ship and house building, furniture, or any other purpose, while on the wall hangs a slab from the largest log of mahogany ever imported, side by side with rosewood, Italian and French walnut, from the Leeds library. Passing over familiar British trees, we gather a few hints of the extent of our commerce. From North America, the locust-tree and the hickory, so famous for carriage-wheels; from Valparaiso a fine close-grained wood like oak; rosewood from Brazil; a kind of mahogany from Panama, with which, if worth anything, we shall soon be better acquainted; satin-wood and lignum vitæ from St. Domingo—perhaps this came to pay for the sword made in Birmingham for the black Emperor; pheasant wood for cabinet-work, of beautiful deep colour and broad wave, from the East Indies; king-wood, a rich deep wavy red, from Africa; snake-wood from Surinam; hachmatack, a superior kind of pine, from Canada; and a capital white cedar, like a close grained deal without knots, from New Brunswick. New South Wales has contributed red cedar and red gum; the East Indies some rosewood; while an extremely odd-looking book, full of honeycombs, and fit only to burn apparently, turns out to be a piece of a palm-tree.

A capital lesson in geography may be read from this stall of Messrs. Warrissen, without going further. Next to it, Messrs. Holtzapfel, the celebrated turners, who exhibit choice specimens of their lathes and tools in the machine-room, have set out samples of the woods commonly used in turner's work.

A SCOTCH VEGETABLE MUSEUM.

Our next visit must be to a museum prepared by Messrs. Lawsons, of Edinburgh, which illustrates with extraordinary minuteness the vegetable productions of Scotland, comprehending all substances used for food, in the chemical arts, in medicine, in manufactures, in house and ship-building. This collection, which occupies the largest space allotted to any one individual in the Building, ought to be copied in every agricultural college, if not in every great educational institution. It is arranged in the following six practical rather than scientific sections:—

No. 1. Plants cultivated for their farinaceous seeds, together with their straw or haulm.—This section is illustrated by nearly 1000 specimens, consisting of sheaves of all the principal cultivated varieties of grain, and samples of the seed; the less important varieties by a few ears of each, and a proportionate quantity of the seed. Peas and beans are shown in wax models of the size and colour of nature.

No. 2. Four hundred specimens of plants cultivated for their herbage and forage, illustrated by dried bunches of all the natural grasses and those termed artificial, in which are included the clovers and other plants, both granivorous and leguminous, used for the feeding of cattle, with seeds of all species.

No. 3. Plants cultivated chiefly for their roots.—Comprising potatoes, turnips, carrots, parsnips to the extent of 600 specimens: the plants and seeds are dried, the roots, being perishable, modelled in wax. A book lies on the table containing a series of coloured drawings of roots, either the size of nature, or, where that was impossible, drawn to a scale.

No. 4. Plants cultivated for their uses in the arts, manufactures, and economical purposes.—This section comprises above 400 specimens—plants yielding fibre, as flax, &c., oil, colouring matter, or dyes; plants for miscellaneous purposes, such as the fullers' teazle, &c. The seed is shown; then a dried specimen of the plant in flower, followed by that portion of it prepared for its economical value, and concluding with an instance of its use and application, such as worsted dyed with wood.

No. 5. Plants cultivated for their medicinal properties.—Six hundred preparations of plants in blossom and seed, and the extracts, oils, essences, powders into which they are prepared for pharmaceutical purposes.

No. 6. Plants cultivated for their timber, includes the seed, the leaf, the blossom, a transverse and longitudinal specimen of the timber in its rough and polished state; also the plants of the principal forest-trees, as raised in various stages of growth.

Thus it will be seen there are all the materials for illustrating practical lectures on the vegetable productions of agriculture and the art of planting. Among the curiosities we must note two specimens of the tussac grass, discovered in the Falkland Islands, and grown in one of the Orkney Islands. Here we must pause to resume next week "on fresh fields and pastures new."

KILBURN'S PHOTOGRAPHIC PORTRAITS.

The readers of the ILLUSTRATED LONDON NEWS must be already sufficiently familiar with the name of Kilburn in connexion with Photographic art. We have frequently taken advantage of the talent and skill of this gentleman, in giving to our artists portraits from which they have made their engravings. He has exhibited a choice screen of the most lovely portraits which this art can possibly supply. Great difference is shown in the manipulation of different persons; and we must remember that the light of London, filtered as it is of its best rays, is but very ill adapted for the purpose of the Photographist, and in this respect the Americans and French have natural capabilities which render the practice of this noble art very much easier than it is in English towns.

Mr. Kilburn has greatly excelled in giving pictures the images of which are particularly clear and in very distinct relief. We think that the picture of Jenny Lind standing by the piano with her face to the audience, but at the same time showing the back by the reflection of a looking-glass, is a masterpiece of this art, not excelled, if equalled, by any other specimen exhibited throughout the entire Building. Again, the picture of the child standing beside a young donkey exhibits a group which we can hardly imagine to have been taken from nature, though, from its being thus labelled, there can be no doubt of the fact. His whole collection is contained in one small screen, but it unquestionably is a screen of surpassing beauty, and we can cordially recommend the visitors to the North-west Gallery to examine it carefully for themselves.

BEARD'S ENAMELLED DAGUERREOTYPES.

Considerable interest has been excited amongst the practisers of the Photographic art by this very important improvement in Daguerréotype pictures. When we compare the first sun pictures which came from France with those which now are made, the difference is striking enough, as extensive improvements have been made in the process. Nevertheless, the liability to tarnish which the plates possess—from the universal presence of sulphur in the atmosphere of this metropolis—was a great drawback against their use, and, further, the absence of colour was very unpopular with the English public. The absence of colour was in some degree remedied by dusting over the pictures with various powders, which much enhanced their beauty. Still, this might be readily rubbed off, and offered no obstacle to the liability to tarnish. After a time, Mr. Beard turned his serious attention to the matter, to endeavour to cover the plate with enamel, and also to give colour to that enamel. This photographist succeeded in getting a transparent material which could be employed hot, and thus form a beautiful covering to the silver plate. But then came the great difficulty of colouring the enamel. Nevertheless, after a certain time and ingenuity, he found that, by grinding the colours with the material and painting the composition, the whole could be fused and form a brilliant enamel, which would resist wetting, would protect the plate from tarnishing in the air, and be in every respect like a miniature painting.

In the North-west Gallery our readers will perceive a case contributed by Mr. Beard. In the first place, he shows three plain Daguerréotypes after the old plan. Then he shows two or three coloured by the powders, and the remainder exemplify this new and great advancement in photographic art. In the first discovery of any invention, it is impossible to tell to what perfection it can be carried; but to us it appears to possess a capability which, should no drawback be found, will give to Photography a far higher importance than it at present possesses, and cause every family to have a photograph of all its members.

LETTERS FROM LONDON
ON
THE GREAT EXHIBITION AND OTHER MATTERS,

ADDRESSED TO HIS UNCLE ENOCH, HIS AUNT HULDAH, DEACON BIGELOW, AND OTHERS.

BY PELEG E WHEELER,

Of Penobscot, State of Maine, U.S., member of the Penobscot Historical Society, and Major of its Independent Corps of Boundary Volunteers.

WITH AN INTRODUCTION BY BAYLE BERNARD.

(*Continued from page 497.*)

LETTER II.—TO MR. B. B——.

THE GREAT FOCUS AGITATION; TOGETHER WITH THE MAJOR'S "NOTIONS" AND CONTRIBUTIONS TO THE "WORLD'S SHOW."

OLD ACQUAINTANCE!—

Well—I shut off my last by telling you how the news of the World's Show shook us up in old Penobscot; what a quiverin' it gin us, and what we did to start it right away to Mexico; and I darsay you'll conclude that a start was all it wanted, that 'twas like fire on a prairie—one puff would singe a deestrict, and I guess that was the fact. The first grain blazed the barrel, and it's been going ever since, full chisel, like the anti-slave law principle or the tide for Calyforny! Only there's another fact aside on it, and that's jist about as shameful; jist as humbling altogether as a dab of tar on a clean shirt. That's the fact, that our town, which begun this noble movement, that was a beacon and a trumpet to our entire and glorious union, all of a sudden stuck as fast as if it had roll'd into a quag hole. Didn't go ahead a mossel, but sunk down and lay as still as if 'twas used up by an agy, or had got knocked down by a trive. It was for all the world like a live torrent leaping down into a dead pool, or a burst of our spruce beer—arter the cork and froth was out there was nothing in the bottle! Now warn't this enough to ryle a man; arter the Doctor's speech and leader had woke us up like any thunderbolt—had set every body panting and running here and there, to ask what was best to send, and how 'twas best to ship it, to see the bilin all upset, and the hull work to do agin, the kittle right an eend, and the fire all turn'd to cinders! If I ever felt so ugly, I wish I may be shot! so altogether wolfy about the head and shoulders! I felt like old Col. Kench, that kept the tavern at Cook's-ferry, who only swore but once a week, and then he took a day to it.

But swearin' aint assistin'; and what's more's agin my principle, which is allers to balance matters, and keep the pressure even. My dooty was to cure the evil, and not to stand and blurt at it; and tho' there's two ways to cure a pig—with either salt or sugar—there's only one to cure misfortins, and that's by cool reflection: so I sot myself reflecting, with half a day before me, and a glass of tally bogus, and, as coolness was essential, I put a double lump of ice in it. And jess see the good effects on it—see the beauty of my principle. In less than half an hour, I had hit on the prescription: I saw as clear as mornin' that what we wanted was agitation. There's no brewin' without a ferment, and no gitting a public good, unless you make a stir for it. The public mind coagulates, and wants a spoon occasionally; and if motion lets in purity, it also lets in light. So I came to the resolution, that this congress of all nations, should form the one idee and top-notch of my establishment—should enter into everything—be the Focus electricity; should be stuck up in my winder, and be talk'd across my counter—be tasted in all my juleps, and felt in every yard of broad-cloth; and I rather think that was the case. Whoever wanted a ball of cotton had it pack'd up with the principle; or half a pint of cyder, had to swallow that besides. I spoke to 'em in this way. I said, whoever has time and money—and it won't take much of either—is bound to go to London; bound to contribute suthing to the Warehouse of the World. And if he ain't no goods to send, he's bound to go himself—bound to give his vote in person, to its noble undertakins. Contribution is the word—contribution, I pronounce to be the first dooty of the day!

But I didn't pull up here: I've an auction twice a week in a loft that's next my neos-room, where I work off surplus stock, winter fashions, remnants, and corner stuff of all kinds (especially as I have a fishing smack, and do suthin' in the salting line), and I never began business but I started by observing, that a clearance must be made, on account of the various articles I was sending to the Exhibition. And, though it's true that after a week they began to think it all a hum, yet what did I keer for that? my haul was all the same. The notion served to clear the floor, and keep the great idee in mind. And that warn't the hull tack nuther; I aint the worst of lawyers. Not that I approve of law, no more nor I do of muskits. I take both to be a proof that the human mind is still in its catypillar state, fonder of crawling than of flying, and of mud than of the bright heavens. But if it's needful in self-defence, and self-defence is a law of natur, what on airth's a man to do? It was only on this principle that I jined the volunteers and riz to be their major. They defend the State, jist as a lawyer defends himself. And if it's right to drive off furriners, why not foes at home? Law's a pocket-pistol, 'taint desirable to carry one: but what's a man to do if his life's allers in danger? Now, as whoever is a lawyer must be thinking of the legislatur (I shall stand for it some day, as sure as the noo moon), I hit on my last notion, which I think you'll say is a clincher, quite a joist-pin or a screw-nut to all that went afore it. I stuck up in my winder a petition to the Assembly, to guarantee every contributor the amount of his expenses, say for a three months' stay in London, and a fortnight's squint at Paris; and I called on all contributors to come and sign it at my bar. And I spose I needn't tell you there was a tidy call for quills. I ruther think that proposition put the steam to our town intellect; set a raft of chaps inventing, that never even plann'd a tater bed. In less than half a day the tide-way at my door was a wonder to behold. Why the gulf-stream was a fool to it; and as public ardor allers has a double kind of thirst, you see the place was fort'nate. There were juleps to be had, and they could carry out my principle of establishing a balance.

So hurrah for agitation! And now the noos was well afloat, I spose you'd like to know how I help'd to keep it going. Arter raising town and country upon the pint of contributions, what I proposed to do myself, speshally as the great show was for mechanical inventions, and upon notions of that natur my reputation rests. Well, we've heerd a good deal lately of the world's "productive forces," and if my head don't count among 'em, I want to larn the use of Catalogues. I should like to know the year that I haint cropp'd it once or twice of some good beneficial notion, and if it aint got into operation, of course you see the cause. Ignorance and prejudice are the first of vested interests—have allers got out a capital that keeps progress from the market, tho' its only for a time, for let 'em fix it as they will, truth must konker in the eend. So this Show of the Hull World is jist the thing to do me justice—jist a superior Court of Ekity that genus can appeal to; and I aint at all oneasy. Let 'em hollor out my name and see if I don't cry "Here." Let 'em call for the Major's samples, and jess mind if he looks skeer'd. The only knot that troubles me is what sample I'm to send—I find it so dreadful difficult to say which on 'em's the best. Perhaps you'll give me your opinion; and as a sorter rail to lean on, I'll say a word or two about their ginral skeme and karikter.

Now you know that the human mind has allers had two classes. The inventin' and adaptin'—the one to throw out principles, the other to shape machinery; and that the two are never jined, because natur is specific, and likes to run in single grooves, both for the sake of order and the doo increase of force. No strength without compression. A stream that turns a mill, if you split it into two, mayn't have power to bend a bullrush. Now of these two sorts of intellect, mine counts in with the first. It's altogether good for principles, but not so well for frame-work. It will give you the idee, but don't keer to work it out—will bring forth suthin' daily, but is quite content to leave to others all the training and edication; and of course I needn't tell you which of the two is most important. For what's a body without life—what's an ingin without a principle? Toobes and pistons are a wonder, but you want steam to set 'em going; and schooling's thought the jam — but how if there warn't no babies? Now, tho' all this is as plain as the base of Mount Katardin, yet such is the mean ignorance or envy of mankind, that all my notions have been peck'd at—not stolen, I admit—they hadn't courage to do that, but either falified or doubted. People pretending that they wouldn't work—that there warn't the smallest grain of use in 'em, when, as I allers said in answer, "Whose fault is that but yourn—yourn whose dooty 'tis to shape 'em? I give the notion, that's my share; 'tis for you to find machinery; and if you'd only stick to your groove, as I have stuck to mine, the thing would be done at once, and the world be all the richer." But common sense won't do for 'em. When people will be blind, light itself is jist a dungin. So, whenever I launch'd a notion, confining myself entirely to the announcement of its principle, I was allers sure to hear the same old stupid cackle: "How do you do it?—how do you do it? It sounds all very well in theory, but jess show us how it will work." As if I had anything to do with that! As if they didn't know their dooty, jest as well as I did mine; and I couldn't see this blather was a blind to screen their lazyness, or, what's worse, their want of brains to carry out my principle! Agin and agin I said to 'em, "My business is to invent, your dooty is to execute. I suggest; you make it work, and I sell you my suggestion!"

Now about all my suggestions there's been one peculiar feature—a wonderful simplicity! And simplicity you'll allow is allers a mark of power. Every one I'm going to mention a child could understand, and you'd almost think, to boot, that a child had skeemed and fix'd it. To take 'em now in classes, some on 'em, for instance, go on the compressing system, a sorter feltin' process, such as to jam sawdust into boards, or iron filins into bars; while others are more mechanical, such as a cabinet machine, in which you turow shavings into one door, and pull card-tables out of tuther. Others again illustrate the natur of the momentum, and do all kinds of poundin' and refining operations. And one on 'em perhaps is my most comprehensive notion. Its capacity is so great that it can either drive the piles of a bridge, or pound homypathic pills—the force being adjusted by a screw I call the rigila'er, and the only difficulty being to make the rigilator work! Another lot agin shows the power of division—don't combine, but separate: as, for instance, my new patent sassage apparatus, which is a funnel with two spouts to it; and all you have to do is, to put a hog into the funnel and set the screws a-going, and then the result is this—that sassages come out of one eend, and patent scrubbin' brushes out of tuther; thus dividing the animal into inside and out, which I think you must allow to be a beautiful simplicity!

Another lot, agin, go on philosophic principles; as, for instance, a waterproofin', either for upper coats or hats, which is made out of maddogs' skin, and which, of course, by force of instinct, is obliged to throw off water! And, agin, another notion—which, perhaps, I vally most, because of all it's most likely to be of sarvice to society—it's my "Edication Skull-cap," which I've invented with a view of carrying out phrenology—a science, I must tell you, that I've studied for some years, and have come to the conclusion that it's identified with progress. Now, I needn't talk to you about our present edication—the waste of time and money on our modern schools and colleges—places which yield a crop of wickedness afore a single grain of knowledge, and draw the mind out in the way we do a heifer from a cow-pen, to kick and tear about, and do all sorts of damage, marsy knows how long afore it suffers yoking. Now, to set aside all this, I've invented a steel skull-cap, to screw down upon the head just arter a child is born, with good capacious holes in it, to let all the proper bumps come up, and plane surfaces elsewhere, to keep down all the bad 'uns. And if that aint a notion for economizing schooling, and ensuring to humanity an inevitable development, why I'm content to say I aint the smallest judge of principles, and am willin' for the futur to give up public sarvice.

Perhaps you'll turn these notions over, and tell me which you think the best. The ginral impression here goes in favor of the sassage-trap. That's t ought to be the clipper; tho', of course, at our society, all the votin's for the skull-cap. So, to bring their claims to issue, I've form'd a committee at the Focus, that hold their sittins every day on the tubs about my bar, and the matter's been discuss'd with a proper sight of sperit. First-rate argyment, I tell ye. So much so, that the noos has made another agitation—raised a fresh surge at the door, so that you'd think 'twas a Vandew day, or a Caucus at the least. Well, amongst the dust and stubble, there's this startin'-pint thresh'd out—that I'm bound to go to London, whatever traps I carry—that I'm the man to represent Penobscot, whoever represents the State. That's the gin'ral ankerage. They all make fast to that; and there's only one that warn't unanimous, and that was my wife Kezy. Now, I 'spose I needn't tell you, she's a most partiklar good woman—a first-rate bit of furnitur'—and, for the station she's been call'd to, nothing short of a rale genus. She can buy and sell by instinct, and measure with a look, from a gallon of peach brandy to a yard of satin ribbon. And as to her deportment, it's as stirrin' as a cocktail. She's as lively behind a counter as a young alligator behind a mud-bank in a creek in Caraliny! She's a screamer, and that's the fact! But, for all that, she's no philosopher—not a mossel of that pattern—can't stir from her own door, tho' she'll help whoever comes to it. Not the lissom kind of timber that you can shape to common sarvice, but jist the harder sort that's fit to prop a house with. So it aint so much a wonder that she never keer'd for the World's Fair; nor, least still, liked my going to it. She never seed the use on't. What on airth was I to go for? and my contribution too, said she. But I guess that warn't the tote on it; she'd heerd that London doings warn't exactly 'cording to catychism—warn't as riglar as a corn-trench, if they happen'd to be as hollar. And speshally she'd heerd about the Royal maids of honour? that they were a most lovely set of fillies, but allowed too much of pastur—dreadful pretty, but as wild as if they'd been raised upon a prairie; and as she know'd I'd go to court, she thought I'd get to know 'em, and perhaps be going about with 'em to Vauxhall and other places that she'd heerd tell on, about London, and treatin 'em to oysters; so afore I could smooth her down, and get her forchead out of wrinkle, I had to give her my solemn promise I wouldn't speak to a maid of honour all the time I was away.

So you see I've had my difficulties, my knots and edges to plane down, though my dooty was clear as daylight; and the occasion was so noble. Had a tussel for it, I tell you, though my credit was at stake, and that of all Penobscot, as represented in my person. However, it's fixed at last, there's no mistake on that pint, and I'm off to England in the spring, jist as sartin as the swallows. And now perhaps you'd send me a few particklars about the building: when it's to go up and what's to be the size on't. It oughtn't to be less than Noah's ark if it's to roof in all existence; speshally as in this case the critturs clean or onclean wont come in pairs but thousands. You must be jess so good as to get me an airly stand in it, if you please. A good centrical position, where I can clap myself and contribution, and be able with convenience to address a tidy shoal of people. I dar say I could manage to be heerd throughout the premises; but as that would seem conceited and might hurt the chance of others, a crowd of about eight hundred every quarter of an hour, would be as much as I should keer for. I see a committee is appointed to carry out the skeem; perhaps you'll speak to 'em on the matter. Perhaps they may have heern on me; and if they haint, you can make my compliments and say I shall be glad to hear from them. I dont know that I've anything to add to this jess now; only as the subject's jist begun to stoo, I dar say in a month or so I'll send you another skimmin'. So, hoping this finds you well, and an answer by return, I remain your friend and countryman,

PELEG ELDAD WHEELER.

Hold on a bit!

I've jist another word—another package for the tail-board. I hope the committee won't forget that when the hull world comes together, they'll want to do a little more than jist shake hands with one another. If there's any summer in your country, they'll want to drink of course; want to ratify their union by swallowing suthin' that shall wash away both dust and recollections. How's that river Thames of your'n? I hope it's as big as the Mississippi, and what's more, a little cleaner. You'll get your shipping work well over, and your big craft out to sea; for it would be ruther awkward sartainly if our coming lowered the draught. Do you think too you'll have any fellers who know how to make a julep? because if the weather's hot, that aint the worst of contributions. I'm ruther good at that myself; so jist name it to the committee, and if no one's on the ground, say I wouldn't mind myself undertaking the sling department.

PELEG E. WHEELER.

Here, here; hold on agin, for marcy's sake!

The noos has jist come in, that this meetin' of all nations is the notion of Prince Albert, made and shaped in his own head, and turned out fit for workin'. Well now, say—ain't he a sample! jist to think what he was born to, and what has been his schooling, and that sich a skeeme as this should grow up in sich a hot-bed. Why, it's like what they see in South Ameriky, where a volcano, instead of a blazing up and spittin' fire and cinders, turns it's sides into a cornfield. There'll be some products at the show, which, I spose, 'twould be hard to size, but I doubt if among the hull on them there'll be a better than himself. If he'd come across the water, wouldn't we be civil to him! I think the States ought to invite him. There's only one thing I can do—make him a member of our society; only there I'm in a fix! It's agin our rules to let in Royalty; but as he ain't quite a King, only a King consort, perhaps it might be managed. So, if you should see him, hint the matter; and if you find he's no objection, say the word, and up he goes!

P. E. W.

(*To be continued.*)

THE HISTORY OF INDUSTRIAL EXHIBITIONS.

BY W. BLANCHARD JERROLD.

(*Continued from page 500.*)

CHAPTER IX.

THE EXHIBITIONS OF ENGLAND.

THE present Great Exhibition of the Industry of all Nations is the first attempt made on a national scale to gather together for popular and scientific instruction the products of the skill and ingenuity of the greatest commercial nation on the face of the earth. It is strange that the country of Wedgwood, of Arkwright, and of Watts—the seat of the most advanced manufacturing processes, the focus of unlimited capital, the spot whence laden vessels radiate in every direction, the country whose flags float above more wealth than any rival state can boast, whose scientific men have led the way in the pursuit of truth, whose legislators have stood in the van of political progress—it is strange that such a people should have failed to see the advantages which have accrued long since to other nations from national Exhibitions of Industry. That English manufacturers have, as a body, failed to recognise the advantages of these institutions, is proved in the fact, that they have not imitated them in their own country; for, so powerful is public opinion, so stern is the popular will in England—that a public conviction is the sign for legislative compliance. The reception with which various endeavours on the part of private individuals to accomplish a national Exhibition of the products of English manufacture met repeatedly, confirms the position, that, if this institution has not been before introduced into this country, our native manufacturers are to blame. Opportunities have not been wanting for many years past to carry out native exhibitions with conspicuous success—nothing save the co-operation of manufacturers has been deficient.

In a history of industrial Exhibitions the efforts of the enlightened men who have successively conducted the operations of the London Society of Arts must find a conspicuous place. This society, it may be pertinent to remark, was founded in the year 1753, for the special object of encouraging the development of arts and manufactures in this country. That it has, throughout the century during which it has fitfully flourished, done much to further the object for which it was founded, not even the most prejudiced political owl can reasonably deny. It has had its seasons of brightness and its days of gloom. It has grown and dwarfed with the progress and retrogression of popular enlightenment. It is unquestionably an institution the success of which is a guarantee of commercial enlightenment; and the anomaly which the co-existence of this society with that of manufacturers' indifference in the matter of a national industrial Exhibition, forms a difficult problem for logical dissection. The difficulty is, however, half set aside by a glimpse at the protracted discussions which have marked the foundation of the magnificent bazaar to which the world is now flocking. In the course of these discussions, we find not a few of the eminent manufacturing men of England arrayed against an institution which would draw the veil from the mysteries of their establishments, and make the processes from which their several excellences result patent to the world. They still reverted with pleasure to the dark times of old, when men hoarded their improvements in machinery as the miserable miser hoards his gold; they were unwilling that the foreigner should learn the ingenuity by which they excelled. So pitiful is this narrow view of the commercial aspect of the present time, that the chronicler is inclined to pass by those dissentient voices from the great liberality of spirit which is the boast of Englishmen; but their eminence as manufacturers gives their opinion a weight the more dangerous and to be guarded against, from the animus with which it has been given. The names of a few of these gentlemen have been printed in a report made to Prince Albert, in 1849, of the opinions of English manufacturers on the subject of a great international exhibition; and we are content to let this document lie in the library of the Society of Arts for the edification of future generations, without giving the trivial and vexatious opposition which it describes the currency of these columns.

Having referred to the operations of the London Society of Arts, and premised, that, although the Society annually exhibited these specimens of the competitors for its prizes, it did not succeed before a very recent date in gathering together a complete exhibition of any English industry, it is necessary, chronologically, to direct the reader's attention to the career of the Cornwall Polytechnic Society, which appears to have been the first institution in England that systematically gathered together specimens of local industry for periodical exhibitions within its walls. Eighteen of these exhibitions have already taken place. The latest of these was opened in September, 1850.

Cornish ingenuity has been keenly excited by the prizes annually offered at these exhibitions; and, accordingly, we find several inventions of some importance ranged within the Cornwall Polytechnic walls on the last occasion. Among these figures, a large model by Mr. T. Ward, of Falmouth, showing a method of building under water without the use of the diving-bell, &c. The construction of this model was rewarded with the first silver medal. The second silver medal was awarded to Mr. John Pool, jun., of Copperhouse Foundry, for a model of an improved paddle-wheel for steamers. In this wheel the floats are only half the usual size, the deficiency being made up by an additional number. The inventor asserted that by the adoption of his plan the concussion on entering the water would be much less than with a full-sized float, and on leaving it the backwater would be much diminished. "The method of shifting the floats and contracting the wheel's diameter is so simple that it can scarcely ever get out of order, and their division into two series will admit of each portion being reefed separately. The advantages of this will be felt in a heavy sea, when, to secure a proper resistance for the wheel, the inner series of floats may lie left of the full diameter, and the outer ones may be close reefed. By these means the wheel will seldom be entirely out of the water, or so deeply immersed as to check the speed of the engines. The reefing is effected by means of a toothed wheel and pinion movement."

The first bronze medal was adjudged to the inventor of a plan for producing sharp casts of plaster by means of a vacuum. The jury of the mechanical department report the progress of county ingenuity with justifiable pride. The following paragraph of suggestions is extracted from the jury's report:—"Plans for improvements in forming cogged-wheels for mining machinery have, for the last two meetings, been submitted to this society, for which the judges have awarded premiums; and the judges for the present year have with pleasure awarded a first bronze medal to another plan for that purpose, which, in accordance with the opinions of parties most interested in the improvement of gearing, promises to be of extended utility. The judges conceive that this most desirable object can be best effected in each locality by schemes suited to their respective wants or state of progress, gradually developed, rather than by the adoption of forms specially suited to other purposes; and they have viewed with satisfaction the unceasing efforts at local improvement, and trust that as high a standard of excellence in mining machinery will be eventually established as is admitted to exist in the cotton-manufacturing districts.

"The judges have likewise awarded a first bronze medal to a series of elaborate tables especially adapted for the daily calculations of a miner. Their value has been tested for several years in a mine in the eastern part of this county, where they have been found of great assistance to the agents. A first class prize has been awarded to a pocket surveying compass, which promises to be a useful instrument under certain circumstances. A first prize has been given to a model for striking a helix, which shows considerable ingenuity in the contrivances for separating the lines made by two pencils employed. A book on mechanics, of the value of a fourth prize, has been awarded to a boy of fifteen, whose attention has been directed to the improvement of a Savery's engine, of which he has submitted a plan to the judges: they deem they have acted in accordance with the views of the society in this award. The judges have awarded a first bronze medal to the workmanship of a dividing engine, and of a slide rest. As these instruments are of the greatest value in the execution of good work, such as is specially required for the local interests of this county, the judges have since heard with great pleasure that the premium has been adjudged to a person who has been an apprentice to a well-known exhibitor of mining instruments of superior workmanship. A first bronze medal has likewise been adjudged

to a skeleton clock, the parts of which were cast, made, and cut by a clockmaker of this county, in rivalry of the work of those districts in which clockmaking is a special trade. A second prize has been adjudged to a set of small knives, for the skill and ingenuity exhibited in their workmanship. The judges do not consider such ingenuity entirely wasted, since its exertion confers a power on individuals that may eventually be applied to objects of utility; and the same remark is applicable to

1.—ICE VASE —BY MR. DODD.

a prize of the value of 2s. 6d. adjudged to a lad for a puzzle-box that he has exhibited. The judges have further awarded the society's second silver medal (not convertible into money) to an extremely well-executed drawing of a balance apparatus used in the coal-mines of Wales, and applicable, under some conditions, to the Cornish mines. They are satisfied that this society is extremely desirous of encouraging a full and accurate knowledge of the practice and plans of other mining districts, with a view to their adoption, or the employment of such modifications as may be deemed advisable. The judges, with the consent of the committee, have awarded an extra prize of £2 to a small model of a steam-engine, made by an engineman in his leisure hours, which is well executed under circumstances of obvious difficulty, and which must have required a study of the form and proportions of every part of an engine, which must be a very useful exercise to a person to whom is entrusted the constant care of an engine."

3.—ORIGIN OF THE QUARREL OF THE GUELPHS AND GHIBELLINES.—DESIGNED BY F. R. PICKERSGILL, A.R.A., FOR MESSRS. ROWNEY AND CO.

and the processes which tend to cheapen the production of its embowelled wealth, receive daily new and improved developments.

Next in order of succession, Manchester claims popular notice, for its endeavours after an industrial exhibition. The idea of establishing a collection of "specimens of natural history, works of art, and mechanical contrivances" within the walls of a Mechanics' Institution is attributed, in the report of this institution for 1838, to its President, Mr. Benjamin Heywood; and it was at this gentleman's sug-

2.—CLARET JUG.—BY MR. DODD.

gestion, that, in 1837, a circular was issued to the manufacturing and scientific men of the county, which, as it indicates the comprehensiveness of the first Manchester scheme, deserves a *verbatim* insertion in a History of Industrial Exhibitions:—

Sir,—I have the pleasure of informing you, that the directors of this institution intend, during the Christmas vacation, to open the various class and lecture-rooms for the exhibition of objects illustrative of science, art, manufactures, and natural history, to afford the members of the institution and the public generally an opportunity of inspecting, at their leisure, the present state of the arts and manufactures of the town; to bring together numerous instances of the practical application of those scientific principles so frequently expounded in our lecture-room; and thus, by blending instruction with amusement, to furnish to the great community in which we live a source of intellectual improvement and rational recreation. The following outline will display the principal features of the intended exhibition, and it will, at the same time, be useful as a guide to those friends of the institution who may be disposed to promote this object by the donation or loan of philosophical instruments, models of machinery used in the various important branches of British manufactures, and specimens illustrative of the several departments of natural history. EXPERIMENTAL PHILOSOPHY—*Statics and Dynamics:* Instruments to illustrate the laws of equilibrium and motions of solid bodies; elements of machinery, various kinds of levers, wheel and axle, pulleys, inclined plane, screw, and the wedge, their application to modify motion; illustration of centrifugal force. *Hydrodynamics:* Instruments to illustrate the laws of pressure, equilibrium, cohesion, and motions of fluids; hydrostatic paradox, press, bellows, balance, &c.; hydraulic machinery, water-wheels, machines driven by the reaction of water; clepsydræ, hydraulic ram, Archimedes' screw, blowing machines, &c. *Pneumatics:* Instruments for exhibiting the mechanical properties of air and other elastic bodies; air-pumps, condensers, barometers, machines for raising water, various kinds of pumps, syphons, fire-engines, &c. *Heat:* Instruments for illustrating the theory of heat, such as thermometers, pyrometers, parabolic reflectors, &c. *Light:* Sectional and other models of various optical instruments, such as telescopes, microscopes, camera-obscura, camera-lucida, &c; instruments for exhibiting the polarization of light, optical delusions, machines for grinding lenses and specula. *Electricity:* Comprehending instruments for illustrating the phenomena of electricity derived from friction, galvanism, magnetism, electro-magnetism, and thermo-electricity. *Astronomy:* Models of instruments for the purpose of observations and computation such as mural circles, transit instruments, &c.; contrivances for illustrating the motions and phenomena of the heavenly bodies, such as planetariums, orreries, armillary spheres, &c. *Geodesy:* Instruments in use for surveying and

The Cornwall exhibitions, like all others (except the last three at the house of the London Society of Arts), have partaken of the character of bazaars, since they have included curiosities in natural history from all parts of the world, as well as amateur oil and water-colour paintings. Yet, even under the general head of natural history, we find that the jury paid particular attention to county exhibitors. Thus, the second silver medal was given to William Loughren, of the coast-guard, for ninety species of fishes procured from the Cornish coast, and preserved by himself. "Of less value is the collection of Algæ by Miss Warren, to whom we also award a second silver medal. The specimens are named systematically; and, if they do not form a perfect marine herbarium of Falmouth harbour, they leave but little to desire." Even the Cornwall boys contributed illustrations of the natural history of their county, in the shape of collections of bird's eggs. The exhibition consisted of 612 distinct articles; and the presence of a remarkable number of boys and men of the working classes, attests the spirit of emulation which the institution has evoked throughout the country. The rich resources of Cornwall are by its agency subjected to a thorough mechanical and scientific examination. Cornwall naturalists are encouraged to class the living creatures indigenous to their county; miners are exhorted to improve the machinery of their mines; amateur artists are offered a public wall for the display of their local sketches; the young ladies of Cornwall, as they pace the shore of their southern county, are reminded that they will receive honour and thanks from their neighbours if they will learn to class the weeds which cluster about their feet; and the coast guard, as he wanders moodily along the sea-side solitudes of Land's End, is stimulated to play his part at the local exhibition. The industry, the science, and the natural history of the county find their annual representatives;

4.—GROUP OF VASES, &C.—BY MANSARD.

division of land, theodolites, levels, circumferenters, perambulators, pentagraphs, &c. *Chemistry:* In addition to the apparatus usually employed in chemical demonstrations, it will be desirable to obtain samples of the various drugs used in the arts, particularly in the processes of bleaching, dyeing, and printing. THE FINE ARTS—*Architecture*: Models and drawings of public buildings, specimens of materials used in their construction. Specimens of sculpture, modelling, carving, painting, engraving, &c. THE USEFUL ARTS—*Brickwork*, *Masonry*, and *Carpentry:* Specimens of building materials, such as stone, marble, brick, lime, cement, &c.; models of roofs, centres for bridges, specimens of various kinds of wood, &c. *Mill-Work:* Models to illustrate the elementary parts of mill-work, the different methods of engaging and disengaging machinery; contrivances for equalising, transmitting, and converting motion from one species to another; models of various kinds of mills, wheels, &c. *Steam-Engines:* Sectional models

5.—STATUETTE FROM VIENNA.—BY FERNKORN.

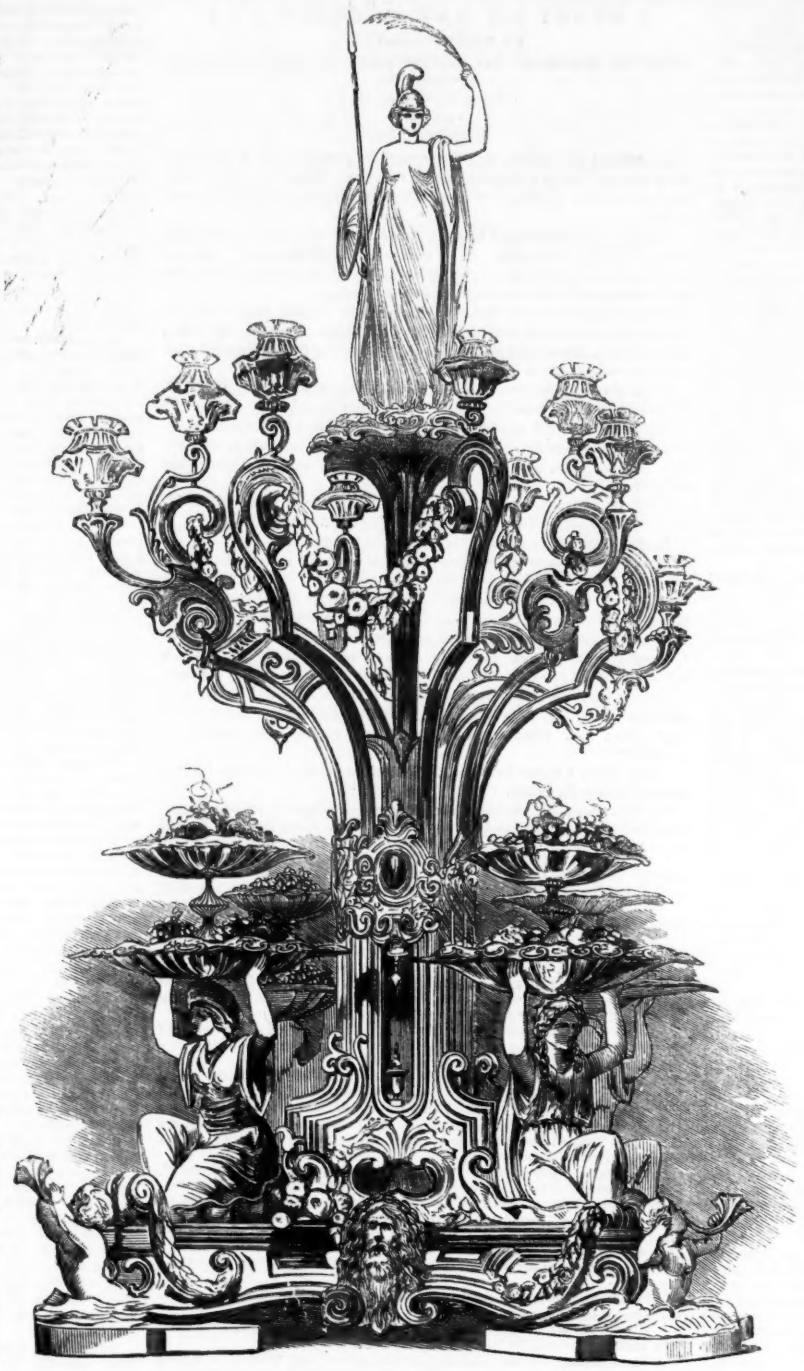
and drawings to exhibit the various parts of the modern steam-engine, under various forms, and their application in the single and double-acting engine, high pressure engine, vibrating engine, &c.; models for illustrating the application of steam power to mining, to navigation, to locomotive engines on railroads and common roads. *Civil Engineering:* Models and drawings of works of public and domestic utility, such as sea, river, canal, railway, and common roadworks, gas-works, water-works, mining, &c. *Manufactures:* Models for illustrating various manufactures from fibrous materials, with specimens in cotton, silk, flax, wool, worsted, &c.; models to illustrate the art of bleaching, dyeing, and calico printing; models connected with the production and manufacture of cast and wrought iron, and other metals; models connected with the manufacture of artificial substances, as porcelain, glass, acids, salts, pigments, &c.; models to illustrate the arts of letterpress printing, by presses and machines, copper-plate and lithographic printing. *Natural History:* Specimens of crystals, minerals, geological charts, fossils; specimens in botany; specimens in entomology, ornithology, ichthyology, zoology, &c.

By the united and zealous exertions of the members and friends of the institution, the directors feel assured that a source of rational and agreeable relaxation may be established, and be made the means of diffusing a great amount of useful and interesting information. It will afford our ingenious mechanics and artisans a convenient opportunity of inspecting the practical application of scientific principles in the construction of machinery; of seeing the present state of perfection of our manufactures, and it is hoped it will be the means of stimulating them to scientific research in the improvement of their respective arts, and assist them to contribute beneficial results to this great metropolis of manufactures.

To make this Exhibition useful, attractive, and interesting, great labour will be required, as well as considerable expense. Every exertion will be made to remove the first obstacle; and, with respect to the second, an appeal to our liberal townsmen, who are always willing to support works of public utility, will not be made in vain.

SAMUEL E. COTTAM,
Secretary.

This circular had the effect of concentrating within the walls of the Manchester Mechanics' Institution a very interesting collection of models, manufactures, paintings, and curiosities in natural history from 150 contributors, for the amusement and instruction of the Christmas holyday folk of 1837. The exhibition remained open from the 26th of December till the 3d of February, and was within that space of time visited by 50,000 persons. At the annual meeting, held a few



7.—CENTRE-PIECE.—BY MESSRS. LAMBERT AND RAWLINGS.

8.—GROUP OF GLASS.—BY MR. GREEN, ST. JAMES'S-STREET.

weeks after the close of this experimental exhibition, Mr. Benjamin Heywood referred to it in terms of great gratification:—"For my own part," said this gentleman, "I am free to confess I had no anticipation of the degree of success which has attended it; and I believe I am not very far wrong when I say that its results have not a little surprised my excellent friends near me who worked so zealously in its preparation. How delightful is the contemplation of everything connected with it. Where shall I begin in the enumeration of its happy influences? Shall I speak of the spirit which animated those who undertook its preparation and arrangement? of the days and nights of labour they devoted to it? of the readiness and kindness with which contributions of all kinds were offered? Shall I speak of the gratification afforded by it

6.—STATUETTE FROM VIENNA.—BY FERNKORN.

to thousands and tens of thousands who had never seen anything of the kind before? of the new and nobler taste which it has awakened in the minds of many of them? or shall I speak of its value as an example to other institutions, possessing rich and beautiful collections, from which the public have hitherto been excluded? It was delightful to see the countenances, beaming with pleasure, of the working men, their wives and their children, as they thronged through the rooms, and gazed upon the different objects; and I could not help feeling in how many of their breasts a cord must have been touched, the vibration of which will have given life and permanence to new and happier feelings within them. * * * * Let me beg your attention to the personal appearance of your directors and your president this evening: we are all in the livery of the institution; we are all in waistcoats woven at the exhibition, by the silk-weaver whose loom and whose work excited so much interest." On turning to the accounts of the institution, we find that the exhibition realised no less a sum than £1078.

The second Exhibition of Manchester industries, arts, and curiosities, was opened on the 26th of December, 1838, and showed a list of contributors 360 strong, and a list of articles amounting in number to 26,300. Amongst these articles there were 31 models of steam-engines, 79 models of useful machines and ingenious mechanical contrivances, 20 models of ships, packets, boats, &c., 400 specimens of manufactures, 12 models of public buildings, 40 specimens of papier maché and cabinet-work, 90 philosophical instruments, 160 ancient and modern curiosities, 1050 medals, coins, and plaster casts of medallions, 171 paintings, 290 engravings, 10,000 insects, 1120 birds, 7000 mineralogical and geological specimens, and 4000 shells. Not less than 100,000 visitors flocked to this Exhibition, and left in the treasury of the institution about £2320. This sum, together with that realised by the first exhibition, were devoted to the long-cherished object of paying off the debt due upon the building of the institution. At the annual meeting held while the second exhibition was open, Mr. Isaac Newton (who appears, with Mr. Belshaw and others, to have taken an active interest in these exhibitions) threw out some suggestions for future guidance. He said, "It has now been practically demonstrated that the most

valuable depositories may be thrown open, at a small charge (that to the Manchester exhibitions was sixpence), to the public indiscriminately; and that the owner of works of art, of specimens of the productions of nature, and of curiosities in general, may rely with confidence on the honour and good sense of the poorer class of his fellow-countrymen; that he may trust his most rare and valuable articles to their general examination, and have them safely returned, accompanied by the warmest thanks of a gratified public. * * * * Excellent as is our present exhibition, I think that it is yet capable of improvement. I should like to see it descend more into our commoner manufactures for some of its articles. One department of it might be appropriated to what should be termed a sample and pattern-room, in which should be placed specimens or samples of manufactures in general. The different trades might be solicited to exhibit in this room the most improved specimens of their various productions. I am aware that this is now carried out in a considerable degree, but I would still further extend it. For example, why should we not exhibit samples of dyeing, of calico-printing, of the cotton manufacture in general, of paper for house decorating, improved specimens of boot and shoe-making, of hat-making, of book-binding, or of any other trade, the articles of which are not too large or inconvenient for exhibition? We have already articles, and most beautiful ones too, of the more showy species of trades and manufactures, such as clock and watch-making, of papier maché manufactures, mathematical instruments, philosophical apparatus, &c.; and why not exhibit also improved articles of some of the more humble but more general and useful trades? These are merely hints for next year's exhibition, which may or may not be adopted, as circumstances determine. But I certainly should like to see our exhibitions possess, in addition to the general interest which they must and will always have, a depository in which as many as possible of our artisans might view and exhibit the most improved articles on which they are daily employed." These suggestions are worth recording in a history of the developement of English industrial exhibitions. In their report for 1838, the directors of the Manchester Mechanics' Institution describe deputations as having waited upon them from several towns for information on the details of the Manchester exhibitions.

The Exhibition of 1840 was a comparative failure, having attracted only 43,450 visitors, and realised £833. It consisted principally of pictures, and is remarkable chiefly for the re-appearance of an *Exhibition Gazette*, started for the special purpose of giving critical descriptions of objects exhibited on these occasions. This *Gazette* is a curious periodical to refer to.

The fourth Manchester exhibition was not opened till the 26th of December, 1842. It occupied four rooms, and included some attractive specimens of improved manufactures. Passing by the collection of Chinese curiosities and the picture gallery, we may at once notice the specimens exhibited by various manufacturers as the results of the Jacquard loom. First of these was a *tableau* of the will of Frederick III. of Prussia, surrounded by a classical design, manufactured by Messrs. Meyer and Co., of Berlin, and presented by them to the Manchester Mechanics' Institution. The *tableau* is woven in what is termed a 3600 set reed. It requires in the working the power of eight machines, each machine containing 600 ends of silk, or 4800 ends in the whole. There are about 3750 cards on each machine, or 30,000 cards in the whole. The size of the paper on which the design is given would be 18 feet by 21 feet, whereas the woven silk is not more than some 16 to 20 inches.

A second specimen of Jacquard weaving was a portrait of Jacquard himself, contributed by Mr. Henry Hilton, of Mosley-street, Manchester; another specimen was the "French Conscript," contributed by the Manchester School of Design; and the last specimen represented the will of Louis XVI., and was contributed by Messrs. H. and E. Tootal, of York-street, Manchester.

The Fine Art department included a contribution from the late Sir Robert Peel. Specimens of raw and spun cotton yarn from No. 1 to No 460; inlaid work, plants, and engravings. The mechanical room, as described in the *Exhibition Gazette*, was particularly interesting. "Here we have a glass-blower, a stocking-knitter, a seal engraver, and a likeness cutter; two kinds of weighing machines, at which, for the small charge of one penny, the curious in corporeal gravity, absolute and specific, can have their own proper ponderosity determined to a fraction; divers hydrostatic machines and pumps; some beautiful railway models, of bridges and stations; a glass in which long faces may be pulled any moment; and an antidote thereto, in one which gives an enormous breadth to the countenance. There is a turret clock, contributed by Messrs. Sharp, Roberts, and Co., which is admirable for its simplicity and strength; and some beautiful working models of calico printing machinery, and of other machines connected with this branch of industry, contributed by Messrs. Thomas Hoyle and Co."

The Fine Arts room included a self-acting pianoforte, exhibited by Messrs. Marsden and Son. It played a number of tunes by the agency of revolving barrels. In this room a specimen of French ingenuity figured, in the shape of a ship carved in ivory, executed at Dieppe. It is possible only to mention other interesting evidences of ingenious industry. Among them were—a hydraulic machine for drawing lead piping; a clock on the principle of an inclined plane, having dials to indicate the progress of time, by the second, the minute, the hour, and longer periods, also the hours and degrees at the various important positions on the earth; specimens of reeds made by patent machinery; pods of cotton from Egypt; specimens of silk spun by wild worms in Assam; "the mechanical paradox;" patent machine (Edmonson's) for printing railway tickets; a machine for testing thread, "which enables the operater to ascertain the strength of the thread, from one grain to a thousand grains;" specimens of cut, coloured, and stained glass; dinner plates of the time of William and Mary, near the latest productions of Staffordshire skill; specimens of the various stages of the flax manufacture; anatomical cast of a horse; a marriage veil worked in Morocco by a Jewess; a series of the Poniatowski gems; "and a flower-basket composed of the hair of about eighty family friends at Hamburg."

Nearly four hundred persons contributed to this exhibition. It was open for nearly three months; was visited by about 100,000 people; and realised about £1500.

The fifth Manchester Exhibition, which was opened at Christmas, in 1844, partook of the characteristics which distinguished the previous exhibitions. An over anxiety to introduce all kinds of attractive, but uninstructive entertainment, such as profile-cutting, &c., has somewhat detracted from the high character which these periodical displays might otherwise have held; and too evident a regard for the pecuniary proceeds, rather than for moral improvement, has lessened the estimate which liberal minds would have formed of the endeavours of those gentlemen who have mainly contributed to the success of these exhibitions. No prizes have been awarded at these Manchester exhibitions.

(To be Continued.)

A RUSSIAN YACHT CLUB.—The port of Havre is about to be visited by a flotilla of a novel kind. There has existed at St. Petersburgh, for the last three years, a yacht club, organised on the model of that of London. The most eminent personages and the richest young men of Russia form part of this club, which includes among its members the Grand Duke Constantine, son of the Emperor, and High Admiral. In order to form part of this club, it is necessary to possess at least one yacht or small vessel rigged as a brig, and capable of carrying a crew of 25 men. The Emperor, as a special favour, and in order to encourage the development of ship-building, has granted permission to the members of this club to cruize for a certain time, and call at the ports of different countries. The St. Petersburg Yacht Club has consequently decided on sending a deputation of its members to visit the Exhibition in London, and that it shall sail between the 25th and 30th inst. A great number of the other members of the club will join this deputation, and they will together form a small flotilla of from 20 to 25 vessels, among which will be three steam yachts, the *Peter the Great*, the *Pultawa*, and the *Catherine II.*, the models of whose machines are in the Exhibition. The flotilla will first proceed to Havre, where, in consequence of the present crowded state of the Thames, a part of the vessels will remain, and a division of only six yachts will thence proceed to London.

CULTIVATION OF THE TEA PLANT IN INDIA.—It is stated, in the last advices received from China, that Mr. Robert Fortune, who has been engaged by the Honourable East India Company to procure and transmit to India a selection of the tea plant, for cultivation in the north-western provinces, has succeeded in obtaining from the green tea districts a large number of the finest plants, with which he was leaving for Calcutta. He had also secured the services of eight Chinese, from the district of Weichow, who have agreed to serve him for three years, at the rate of fifteen dollars per month each. Six of them are regular tea manufacturers, and the other two are pewterers, whose sole business is that of preparing lead casings so the tea-chests. Mr. Fortune had penetrated into the interior of China about three hundred miles; and during the whole of his lengthened absence from consular ports had never been molested, nor in any way insulted. He expects to have completed his labours in arranging the plantations for the East India Company before September next. The first plants transmitted by Mr. Fortune have flourished as well as could possibly be expected, but under his personal superintendence and the attention of the native tea manufacturers, there is every reason to expect the most favourable results. Probably, in a few years, tea will form an article of export from the Indian presidencies.

A STORY OF THE PRESENT DAY.

BY AUGUSTUS MAYHEW,

ONE OF THE AUTHORS OF "THE GREATEST PLAGUE OF LIFE," "HOW TO GET MARRIED," ETC.

(Continued from page 468.)

CHAPTER IX.

THE pigeon had found its way home, to Joe's great joy, for it had been away so long that he had given it over for lost. Under its little wing was tied a letter addressed to Lamere's daughter, and Joe took it over to her.

"Come by my post, miss," he said, handing it over with a grotesque bow. "Special messenger from Thomas Bradley, Esqvire." And he told her with a proud air of his pigeon's achievement, adding, "Just see if he mentions the time when he flewed the earrier."

Kitty was enchanted at the idea of receiving a letter in such a delightful manner, and as she flattened out the crumpled paper on the table, declared that the winged postman was "a darling little pigeony," and vowed a piece of bread for its supper.

So as not to appear curious, Joe walked to the window and whistled. He was surprised to find, that, after having gone through "Nix my dolly" twice, Kitty was still silent. At last overcoming his bashfulness, he went back to the table. She was still poring over the letter, but her face was so pale, and her manner so strange, that he was quite startled.

"What's the matter, miss?" he asked. "Tom been up to one of his larks? He is sich a feller for a spree. What's he been a saying?"

Without answering, she pushed the paper towards him.

It was written in pencil, and so rudely that the lad had to hold it in all kinds of positions before he could make it out. "Hang it," he cried, scratching his head, "it's a pity Tom hadn't let the pencil go of itself; it 'ud have done it better. It's so florishy, the writin' looks like bits o' horsehair. Like trying to read a tea-chest it is—Chinese nothing to it. '*I'm off to*—a-u-s—*hors*—t-r-a-l-i—*trali*—a—*ha*—*Horstraliha*.' What a feller he is for a spree, to be sure! '*God help yer and the old man and the young uns, and*—and, and—*don't*'—what's this—'thuck!' no! that aint it—'thick'—no! that's not it—ah! think, he means—'*think bad of me*.' Ha! ha! what a rum feller, to go writin' that nonsense—aint he?"

"He's gone, I know he's gone, I'm certain of it!" answered Kitty, staring wildly about her.

"Pack o' rubbish," returned Joe. "How's he to go? It takes a forten. Do you think any one has been and fancied him, when he aint shaved for a week?"

"He's gone! I'm sure of it," still muttered the girl. "Now I can see why he was so silent. If he wasn't going, why did he kiss the children so? The way in which he said good-bye, too! Oh, I'm sure he's gone!"

"It's one of his larks: he's always at it—told us he had beef for dinner one day. It's nothing but a spree."

"What will become of us?" sobbed the girl, resting her head on the table; "we shall all die, we shall! Oh! I wish I was dead, I do."

"There, don't take on; he'll be back in an hour."

"No, he won't, he won't, he won't," cried Kit. "How cruel to leave us! O-o-o-o! what will become of us? I wish I was dead—dead—dead!" and the table shook with her sobs.

The poor lad sought to comfort her. It was only a bit of fun—one of Tom's stupid jokes, that was all. Have good cheer, and wait a bit—why not wait a bit? it wasn't much to wait a bit.

But Kitty felt so certain about the matter, that she could listen to no hope. She wept and walked up and down the room, hiding her face in her work, Joe following her, and talking to her, without being able to check her grief; until, at last, as she never even answered him, he thought it better to leave her to herself, and he sat watching her, with a face nearly as wretched as her own.

What was she going to do? She had put on her bonnet and shawl, and, without even noticing him, had rushed down stairs. He followed, running after her in his shirt sleeves, but only just able to keep her in sight—his slippers kept coming off at every step he took. She never stopped until she arrived at the Docks; and, flying through the gates, she went up to the first sailor she met.

"Has a vessel gone to Australia to-day?" she asked the bewildered tar.

"I believe there was one, a very rakish craft, painted white and green—mate got a black eye—that the one?

"I don't know! I don't know! Oh! I knew he was gone," sobbed Kit, stamping her little feet on the ground in despair.

Here Joe came up, and, taking her arm, forced her away, leaving the astonished sailor a long story to tell over his pipe of the neat little craft in distress that had hailed him, to say as how she had been deserted by her mate, leaving her in shallow water, without a shot in the locker.

Although she tried her utmost, there was no keeping the sad news secret. For three days Tom never came home, and the children and the old man were continually asking for him, and wondering at his absence. "It must be known by and by," thought Kitty; so, summoning up all her courage, she told her father what had happened.

"He's a scoundrel!" roared the old man, striking the bed. "He's a scoundrel! To leave three children to starve! He's a scouudrel!"

"No, no, no!" muttered Kit. "I know what he means to do."

"Means to do!" shouted Lamere. "He means to shift 'em off his back on to ours; that's what he means to do. But he shan't; they shall go to the workhouse, they shall."

"Poor little things—the workhouse!" sighed the girl, looking steadily in her father's face.

Illness had made him fretful and petulant. As his leg grew well, and health returned, the restraint of the bed was galling to him, and he would forget to practise the patience he had so often preached. But his child's look rebuked so kindly, that, as if ashamed of what he had said, he could not answer her.

"Poor little things! It's early for misery to attack them. The workhouse! What a home to remember and think of in their future struggles! And the remembrance of a happy home does buoy one up so much. You yourself told me so," she added, artlessly. "If your home had been a workhouse, she continued, how would you have been able to endure patiently? I have seen you gain strength and courage, as you have told me about those happy days—the room with the stuffed birds, and the bright table, and the lily window! Oh! they musn't go to the workhouse, father! Think, too! Suppose we were mistaken, and Tom should prove himself to be no scoundrel, but a brave fellow, what answer could we make, when he came to ask for his little ones—'Where are my children? Come with them. I have a prosperous home for all!' and should have to point to the workhouse? No; they mustn't go there."

"Bless you, my child," cried the old fellow, gazing for a moment on her pretty earnest face, and then clasping her to him. "No, they shan't go: we will live together, and their little faces will sweeten our sorrows by making us share their cheerfulness. Bless thee, Kit, my noble girl," he continued, gazing on her fondly, "bless thee for thy counsel, for, without it, I, who in my old days have need of kindly acts, should have thrust the fatherless from my door."

Poor girl, how her eyes sparkled with happiness! how hopeful and courageous she looked! How calmly she could now talk over the danger that had startled her, blaming herself for having complained when she had work to do and health to support her; it was weak and cowardly!

A new strength seemed to animate her whole being. The thought that with her hands the sick father and the orphan were to be fed, seemed to force the blood quicker through her frame. Their helplessness roused up all her love, until her soul seemed to expand within her, gaining fresh life from each object of her care. Her noble woman's nature shone out in all its brilliancy. Filled with compassion, she thought only of soothing the sorrows of others—the noblest privilege of our nature. With what calmness she talked of the future.

By working early and late, she could make her six shillings in the week. But then the fingers must never flag; she must never think of rest. Out of this had to be deducted about sevenpence for thread, sixpence for candles, and two shillings for rent. There was then only three shillings left to live upon. It was less than sixpence a day to support and clothe five people. But then one of them was a mere baby, and she herself would be easily satisfied. They could hope for nothing more than bread, but it would be the sweeter for knowing that they were able to live together.

The doctor had given them hopes, that, in another month, the old weaver would be well enough to take his seat at the loom again. If this should fortunately prove correct, their pains and trials would be but of short duration, for work was getting plentiful again. The old man had begged hard that he might be allowed to amuse himself in making wooden money-boxes—anything that would help to fill the purse, but he had been forbidden all exertion. An unlucky movement of the body might upset the healing work of months, and poor Kitty was quite shocked and hurt at the idea of her father wishing to run such risks when she was willing to work for him.

But it was sad work to keep pace with their wants. The future always seemed brighter than the present; and it was lucky it did, for that was wretched enough. The rent was the largest item in their expences, and it seemed to swallow up all the earnings. Every penny was laid out carefully, the bread served out in stated quantities, as if among some shipwrecked crew. As for herself, she would often share her portion with one of the hungry little ones, singing and working the harder as if she did not feel the loss. She would be constantly quarrelling with her father for not being hungry, insisting on his eating his allowance, despite his assurances that he had dined like a prince. Her only delight seemed to be in making some sacrifice for the benefit of those that were dear to her.

One unlucky week work became scarce, and for three days, though she begged and prayed for something to keep her needle employed, she was forced to be idle. This threw her back so dreadfully, that when on the Saturday the rent was called for, she had to beg for some little time to retrieve her loss. The allowance of bread was lessened, and by saving that way and working an hour later and earlier she reckoned that a month would see them free from debt. Two shillings was an awful amount to replace, but the penny a day would soon mount up.

It is astonishing how news will spread among the poor. It seems to help them over their own difficulties if they talk of the misfortunes of others. It is always a comfort to know that there is some one more wretched than yourself.

The story of Bradley's departure was soon known up both sides of the street. Every one in their pity added a little more misery to the already heavy load. On the Saturday night, the meeting at the "White Horse" was the fullest of the season. Each smoker had come armed with the latest intelligence; all trying to top each other in swelling to the utmost the calamities present and to come, until, at last, it was only with the greatest difficulty that old Lamere could be allowed to go to the workhouse, and Kitty was positively obliged to jump off Waterloo Bridge, before anything like satisfaction could be given to the assembled friends.

If the matter had ended here it would not have signified much; but in the end, rumour, whose speaking-trumpet is always sounded loudest during the storms of life, reached the ears of Lamere's only creditor—the landlord. The rent was already in arrear, and, growing doubtful of the solvency of his tenants, he came to the conclusion that the wisest thing he could do would be to get rid of them.

It was a duty he owed to his large family; charity ought to begin at home; he should be just before he was liberal; the shirt is nearer than the coat; and a host of wise and noble maxims came flocking in to strengthen his resolution, and next week, if the arrears were not paid up, the old weaver must find credit elsewhere.

When the time came round, instead of sending his little girl as he usually had done to fetch the two shillings, the man went himself. It required strength of mind, he thought, and a child was not stern enough. As he had expected, he was besought to grant a little time for the outstanding week, and in a fortnight he should be paid. But he was not going to be put off, and declaring that he had a bill to meet, insisted on the payment. Little Kit begged and prayed of him to be merciful. She had the money, and she showed it him, but it was all they had to live upon for seven days, and if he took it, they must starve. He was very sorry—very; and, in fact, wished he could make them a present of the debt—nothing would have pleased him better—but he must be paid.

And so he was, for he began talking so loudly, and threatening so heavily, that the girl, fearing that he might rouse her father, and a quarrel take place, at last parted with her store.

Now, what were they to do? The same reports that had aroused the landlord's fears, had shaken the baker's faith. She would receive no money until her fresh stock of work was finished, and until then, how were they to manage? She knew the answer well enough, but did not dare to speak it.

Before the week was half over they were penniless. She had eked her little stock with all her care, scarcely touching food herself, until so faint with hunger, that, for the sake of her work, she was forced to eat. She had laboured so well and successfully that three of the five waistcoats were finished, but at least two days must elapse before she could hope to be paid.

At the usual time the little children stood round her, waiting for their slice of bread. She didn't dare to tell them she had none, for they would run crying to her father, and she dreaded the talking over of their wretchedness more than the enduring of it. Besides, she knew that if she did not take him his crust, he would understand that the cupboard was bare, and the pang of telling him so would be saved to her.

As the little things grew restless with their disappointment, she seated them round her and began telling them all the fairy stories she could think of, to try and make them forget their hunger. For two hours she talked to them incessantly; for, directly she ceased, the shuffling would begin, and their bright eyes would glance at the bread-pan, as if asking for food.

Unluckily, in one of the stories, she had to describe a Royal banquet and, thinking that a long and minute description of the delicacies might partly satisfy the little things, she showered down baked shoulders of mutton with browned potatoes under them, and new bread and fresh butter in such profusion, that the story had quite an unexpected effect; for the auditors, driven almost mad by the tantalising feast, set up so loud a cry, that no promises, threats, or pettings could stop it.

It was dreadful, her head was aching so that she could scarcely see the work she was slaving at. The little ones, now that the first paroxysm of their grief was over, were huddled up close to each other, sobbing quietly to themselves, and the old man, as if he understood the meaning of their sorrowing, was silent in his bed.

She felt thankful when night at last came. She soon placed the poor washed children in their beds to feast in their hungry dreams; and, lighting her candle, she still plied her needle. All was silent, and the air came coldly through the broken walls, blowing the flame about till she was forced to shield the light with her own body. Sometimes the children would mutter something in their sleep, and toss about restlessly, but she never even looked up from her work, her hand only seemed to fly the quicker. Once she thought she heard her father speak, and fancying he had called her name, she listened. He was talking to himself in a low quivering voice, that every now and then burst out loudly with each gush. Again and again she heard her name called, the old man praying.

How quickly the time flew by. The clocks seemed scarcely to have finished striking one hour before they sounded the next.

"Are you still up, my child?" asked Lamere, at midnight.

Kitty, without answering him, shaded the candle with both her hands, holding her breath, for fear he should detect the cheat.

"Thank God, she sleeps," muttered the old man.

By thus working day and night she had got through two days' work; and by the evening there would be food. But when bread is the only sustenance, the body cannot fast long, and when the morning came one of the children was so weak that it could not rise from its bed. It was cruel, thought Kitty, after all her exertions, to be defeated, when a few hours more would have been sufficient.

She felt the little thing all over, rubbing its cold limbs and talking soothingly, to cheer it up. All was in vain; its strength was sinking fast. The tears fell from her eyes as she pressed her forehead in despair. "Food must be get, and quickly."

With the three waistcoats under her arm, she ran from the room, and, in less than half an hour, returned with a loaf under her shawl. There was bread at last, and never had it tasted so delicious. The spirits seemed to revive. The little ones were laughing and prattling once more, and the old man blessed her so often that she almost felt happy. But the waistcoats were gone, and how was she to redeem them?

On the Saturday she must take home her work. She must visit all her friends to raise the few pence she needed to pay back the loan. Should she fail—and she shuddered at the thought, and tried to shake it from her.

She now worked with the desperation of fear, never ceasing once. She felt she was ill, each hour growing more and more feeble, and terror-striken lest the fever should overtake her before her honesty had been made sound, she did not dare to stop.

She could have cried when, at night, her father, suspecting that she sat up late after they were asleep, made her bring him the candle she had worked by. Luckily, the moon was up, and with standing by the window the light was sufficient. For four hours she managed to continue

her work, straining her eyes, in the half darkness, till they seemed hot as fire. When at last the rising clouds covered the moon, she wept for sorrow that she should be forced to rest. She threw herself on her bed, and, dressed as she was, resolved to watch for sun-rise.

Never once did her eyelids close. The fear of her father hearing what she had done drove away all sleep. Her temples beat against the pillow, and her cheeks burned with the fever of anxiety.

With the first ray of light she was up, and having bathed her head, stood at the window waiting patiently for the darkness to cease. How slowly the blue light of day seemed to steal over the sky. How often would she try to begin, bending her aching head down, and moving her stiffened wrist, slowly and cautiously, so as to gain even a stitch or two.

The chirping of the birds, and the cool morning air, soothed and refreshed her. Why should she fear? her work would be done in good time yet. Four, or at least five hours, would see her at ease.

Oh! how ill she felt; how her brain swam, and her legs tottered. If she had not clung to the window-sill, she would have fallen. All was over now: nature was sinking within her. The father must be told—all she had feared and suffered for, would come to pass. In her agony, she tried once more to finish the hated waistcoat. Propped up in her bed, and leaning against the wall, she raised her hands. Poor girl; she was so weak, they sank and sank, until, nearly fainting with the exertion, the needle dropped from her hold.

Her brain was on fire. Strange indistinct forms seemed to float across the room, until, growing afraid of looking at them, she forced her eyelids down and tried to sleep. It was the rest that nature wanted, for as she lay quietly in her bed her head grew cooler, and she was soon in a deep sleep.

Old Lamere had wept like a child, when, making the children draw aside the curtains, he saw his pale girl slumbering. The unfinished work was beside her, just where it had dropped from her hand. He saw how she had struggled to continue it, and he beat his breast with anguish to think that a month must pass before he could rescue her from her slavery.

It was late when the girl awoke, for the children had sat quietly around their little mother, scarcely moving lest it should wake her. Evening was closing in, and the lamps in the street were shining in at the window. She felt like a new woman, her head was so cool, and for a time she had forgotten her fears. There was only a nervous feeling hanging over her, as if something was going to happen.

The sight of the waistcoat, however, soon reminded her of her sufferings. The next day was Saturday, and then all would be discovered. Why had they let her sleep so late? why not have roused her up before it was night? And yet it would have been useless: for, though the fever had gone, she was so weak, that at the first trial she made to sit up to her work, she sank back exhausted on the pillow. A sullen despair seized upon her. Let the worst come—let them seize her and put her in prison. It had been done to save life—she would have been guilty had she acted otherwise. Every exertion had been used, every muscle strained, to ward off the blow, and now she was prepared for all. It would kill her the quicker, and so end her suffering the quicker too.

But, after two nights' rest, her failing strength was so completely restored, that, in the few hours that were yet left, she vowed to make one more effort. There was only one waistcoat to half finish, and why despair. So much grief could be prevented, that it was well worth the endeavour.

The needle once more glided through the satin, slowly at first, but increasing till it seemed almost to fly. With what rapidity would she thread it, her eye, as she looked up, almost fierce with desperation!

When the time by which the waistcoats ought to have been at the workroom was past, she shook with nervousness. Each moment she expected that Mrs. Lucas, angry with being disappointed, would enter the room. What should she do then? She would be dragged to prison; pass her Sunday—her only holiday—in a prison! Horrible!

The door of the room was opened that she might hear the better. If a footstep sounded on the stairs, she would start with alarm and listen attentively. One of the children was posted on the landing, to let her know directly a tall woman, with a red shawl, was seen mounting the steps. She only asked for another hour—one little hour—and all would be saved.

What step was that? It was light like a woman's. It was mounting higher and higher. Oh! she had come at last. She went to the door to listen. No; thank God! the footstep had ceased at the first floor. To work—to work.

Half-an-hour and she was free. How her hand shook—she could scarcely thread her needle. No, they would never come now; Providence would never allow it. Another tread on the stairs; but she didn't mind it—like all the others, it would cease on the first floor. There was only the collar to finish now; then she would hurry out, borrow the money, and off to the workshop.

But the sound, instead of stopping, as she expected, still ascended. It's for the second floor then—and she forced herself to believe it; though by her lifting her eyes so often to the door, it was clear her alarm was far from quieted. Good Heaven! the tread had passed the second landing. Yes, it was for her. They had come to fetch her at last.

She ran to the landing, and pulling in the child that watched, pushed the door to violently, and double locked it.

Her father, alarmed at the noise, started up in his bed and asked the reason of it. On hearing his voice, the poor affrighted thing rushed to him, and clinging to his neck, begged of him to protect her, weeping and sobbing between her words. As he soothed her he drew from her the cause of her fear; and she told it so prettily, excusing herself by such kindly motives, that he could not help loving her for her transgression.

Just then came a tap at the door. How she shook with fear, and hid her face in her hands. The knock again! she could have screamed for help.

"Open the door," shouted Lamere.

"No! no! no!" shrieked Kitty, stopping his mouth with her hands, whilst her eye looked wild with terror.

"Come in," continued Lamere.

The door was pushed violently for a second or two, but the lock was too strong to give way.

"It's Joe! It's Joe!" cried one of the children, who had peeped through the key-hole. "It's Joe!" and the little thing clapped its hands to think that their little mother would not be taken away.

"It's a good sign for a poor man," said the pigeon-fancier, stepping into the room, "when he locks his door. We lost the key to our'n just six year ago, and, as our plate is of the willer pattern, we have bought a new un. I've brought yer over a present of a bit o' meat for to-morrow, miss; had a go of luck, and got six shillings for a pouter from a young gent; it's as nice a bit o' flank as ever biled in a pot."

"Will you do me another service, lad?" asked Lamere. Pointing to the loom, he said, "It must go at last! and I want you to take it."

"What! going to sell the old 'un?" cried Joe in astonishment. "Dear, dear! I am sorry it's come to that; there's so few weavers as works at the beams their fathers did. Is it really going?"

"And quickly too," continued the old man, "the business is rather pressing."

The screws were quickly undone, and the posts lashed together. They watched the lad in silence, sorrowfully taking a farewell glance at the dearest object of a weaver's pride—his father's loom.

So the waistcoats were redeemed, and taken home. One of them was, however, thrown back upon the young seamstress's hands as damaged. It was stained in two places, where the tears had dropped.

"I'll wear that waistcoat, Kit," cried the father, proudly; "to think that they could call it spoiled!"

(To be continued.)

MR. F. TUPPER'S HYMN FOR ALL NATIONS, 1851. Translated into thirty languages. Hatchard.—This hymn is a short and simple song of praise, to be used ideally in relation to the Great Exhibition and gathering of all peoples. Brief as it is, however, we object to one verse of its composition—

"May we, with fraternal mind,
Bless our brothers of mankind!"

There appears to us to be a pleonasm in "fraternal" and "brothers;" some other epithet, and of more emphatic strength, is required.

THE MARBLE ARCH.—(*To the Editor.*)—Sir: Observing a correction in the ILLUSTRATED LONDON NEWS, of May the 31st, relative to an article which appeared in the preceding Number, I beg to state that even the correction is in error, Flaxman not having been the designer of any portion. The south front was designed and executed by myself; the north by Sir Richard Westmacott.—I am, sir, your obedient servant, E. H. BAILY, R.A.

SIGNOR BOSCO.—The concert-room of the Princess' Theatre was made, on Wednesday week, the arena for prestidigitation of a remarkable kind. Signor Bosco, from Turin, presented many astonishing examples of illusion, executed with incomparable dexterity—birds' heads cut off, replaced, and substituted, and articles of all descriptions abstracted and returned, with wonderful celerity. As the performances, however, are announced to be changed on every representation, description is useless, and our readers must be referred to the magician's programme and his actual feats, which only when witnessed can be appreciated.

TO CORRESPONDENTS.

BRIGHT ELECTRO-PLATING.—We have received a letter from Messrs. Radcliffe and Co, of Birmingham, stating that the patent for this process was taken out jointly by Mr Millward and Mr Lyons, and that the patent was assigned to Messrs Radcliffe and Messrs Elkington jointly It appears to us that the ILLUSTRATED LONDON NEWS cannot entertain the question as to whether Mr Lyons has or has not a right to exhibit the process, as we have only to make the public acquainted with the operation as being now carried out at the Crystal Palace. The process itself is a very important one in its results, as it enables the manufacturer to deposit the silver that it does not require to be burnished. The nature of the operation is very mysterious, and the scientific man has at present not the faintest idea of the manner in which the bisnlphuret of carbon acts to produce this singular result. It is well worth the attention of the investigator; and, when it is thoroughly worked out, the most distinguished electro-metallurgists consider that it will lead to great results

AN OLIVE LEAF is thanked, though his suggestion has been somewhat anticipated
J W, Carlisle—The announcement will be duly made
CLOTTEY—Any almanack will tell you; we cannot afford space to do so
SCRIPTOR and P W F—"Davidson's System of Short-hand"
SARUM—The address of the Board of Health is Gwydyr-house, Whitehall
H W B, Bristol—The season-tickets will, of course, admit till the close of the Exhibition season
G G—We cannot enter into the "Surplice" question
CHARYEDIS may obtain a work on Windmills, of Weale, Holborn
X Y Z, Erfurt—The German edition of the ILLUSTRATED LONDON NEWS is 6d per copy, and will be forwarded on the receipt of the cost
J H—One of Mr Tate's useful books contains the money, weights, and measures of all different countries
A B, Tunbridge Wells; J B R, Carmarthen; and F A E, Great Yarmouth—We regret that we have not room
J L, Berwickshire, and M W, St Albans—The "National Illustrated" Library edition of Boswell's "Life of Johnson" will be in four volumes
J G, Manchester, should apply to a publisher
COSMOPOLITE—See Mr Smart's works on "Elocution," published by Longman and Co
ANTIQUARIAN refers to the "Diary of Henry Teonge," long out of print. Apply to the "Publisher's Circular," Fleet-street
AMATEUR PICTURE-CLEANER—See the "Shilling Handbook of Oil-painting," 86, Fleet-street
A SATURDAY NIGHT READER—See "Davidson's System of Short-hand"
B R F—Address a note to the President's private secretary
UNICE'S FILIEUE—A list of the scholastic officers is given in the "British Almanack"
E E W, Jersey—Queen's College, 67, Harley-street, London, is for general female education, and for granting to governesses certificates of qualification
M A R L, Yorkshire—Rhubarb is a vegetable
A SERVANT, Worcester, cannot compel the parish authorities to enter into the proposed arrangement
AN OLD SUBSCRIBER, Birkenhead—See Bryan's "Guide to the Great Exhibition"
AN INVALID, Liandover—We cannot speak as to the qualification of medical advisers
C H M, Taunton—The fees at the College of Chemistry are for the session, daily attendance, 15s; four days in the week, 12s; one day in the week, 8s
K E F is referred to the published account of the Great Exhibition
A SUBSCRIBER, Woolwich—Recent Travels in Russia
PIPPIN—M. Soyer's Symposium, at Gore House, is now open
A SUBSCRIBER—The recent announcement of the expected 3600 Parisian National Guards was unauthorised
A CONSTANT READER—The first Number of the ILLUSTRATED LONDON NEWS was published May 14, 1842
C O D—See the account of the East India Company, in the "East India Directory" for 1851
R J H, Bilston—We regret that we cannot find room for the illustration
A B (Watch)—Yours is a case for a court of law
E F X—A practical book on Fireworks is published by Simpkin and Marshall
A SOMERSET CORRESPONDENT suggests that Camera-Obscura apartments should be erected in the Crystal Palace, "to aid friends, parents, and children, who may occasionally lose each other"
JULIAN WEBB is thanked, but we have not room for his letter
SCOTLAND will find John o'Groat's House described in Black's "Picturesque Tourist of Scotland"
H S—Apply for fancy rabbits in Leadenhall Market
C E S, Cardiff, is thanked, though we could not avail ourselves of his obliging offer
S M—John Mitchell was tried by the Dublin Commission, in the Irish Queen's Bench, May 27, 1848. See an Engraving of the Court-house in No. 318 of the ILLUSTRATED LONDON NEWS
A SUBSCRIBER, Dorset—Apply for Pembroke's "Arcadia" to Mr. H. Bohn, York-street, Covent-garden
A LADY, Louth—We regret that we are not in possession of the required information
MARIE, Birmingham—Walker pronounces *fief, feef*
CAMBRIA may obtain a list of the Directors at the Company's offices
A CONSTANT SUBSCRIBER, Camberwell Grove—Received
A SUBSCRIBER's query as to the ejectment in Ireland is a case for counsel
BENIGNA, Bradford—Apply at a Berlin wool warehouse
EKNOR—See a minute history of the Koh-i-Noor Diamond in "The Illustrated Year-Book" for 1851
A SUBSCRIBER, Carlingford—At the Royal Naval School, New Cross, Deptford, there are reduced and gratuitous scholarships, respecting which application should be made to the Secretary
CANTAB is thanked, though we had not room for the list
LEARNER, Dublin, is, probably, not aware that replies to his eight queries would occupy half a column of our Journal
QUERY, Hereford—Apply at the Prerogative Will-office, Doctors' Commons
D S D—See the small volumes on Emigration, new published, by Chambers, Edinburgh
H S B, Liverpool—See Bechstein's "Cage Birds"
D O G, Leitrim—The best points of colour for a black-and-tan terrier are, the black intense, tan rich, and the less white the handsomer
A REGULAR SUBSCRIBER, Bodmin—A pyramid, geometrically speaking, has one of its sides, the base, a plane figure, and the other sides triangles, their points joining in one point at the top, termed the vertex. An obelisk is a truncated, quadrangular, and slender pyramid
A SUBSCRIBER, Exmouth—The Old Water-Colour Society's Gallery is in Pall-Mall East; the New, in Pall-Mall
W H should apply respecting the Great Exhibition Prize Essay to the Rev Dr Emerton, Hanwell
G B N, Weston-super-Mare—The money has not been voted
X Y—Wait for Murray's "Modern London," to be published in a few days. Berlyn's account of the Great Exhibition Building is fairly compiled
"Pat's Rival Shew" will not suit
A TOURIST—See Black's "Guide to the Highlands"
ZANY should apply for the work on "Sea-Weeds" to Reeve, natural history publisher
EKNOR—We cannot inquire into the responsibility
ANTHONY should apply to Messrs. Edgington, Tooley-street, Southwark
A CONSTANT READER, Diss—The sale will not be illegal
WINDISCHGRATZ will be safe if he keep his own counsel
A SUBSCRIBER AB INITIO—Receipts for coloured lights are given in a small work entitled "Parlour Magic"
ALPHA—May-flower is the popular name of hawthorn bloom
A "CONSTANT" READER, Southampton, has been nodding. The tale has long been completed
ENQUIRER—There is no claim. The printer of the "Court Guide" will insert your name if it be forwarded to him
COSMOPOLITE—A small work on Public Meetings may be had of Longman and Co., Paternoster-row
A B C, 1851—The Sketch has been received, but we cannot promise its early insertion
AMATEUR—Apply to Ackermann and Co, Strand
R H O, Ballinasloe—We are now in the 1851st year
C A M—The Life Guards had their pig-tails shortened to seven inches in 1804, and taken off entirely in 1808:—

"Though humbled Gallia scoff,
God bless their pig-tails, though they're now cut off."

LECTOR HIBERNICUS cannot be accommodated
F M R, Sudbury—The Siamese Twins visited England in 1829-30; they are still living
G W—The *Great Britain* made her first voyage to New York in 1845. She was newly-rigged in 1846; on Sept. 22, she left Liverpool for New York, and in 24 hours struck on the Irish coast, and was not rescued until August, 1847. Sir John Franklin left Greenhithe, May 19, 1845
DRAMATICUS, St. Ives, will find some account of Mr J W Marston in "The Spirit of the Age, or Contemporary Portraits"
FLORA—Bouquets of choice flowers may be had of Harding, Clifford-street, Bond-street
A SUBSCRIBER, Liverpool—Apply to Mr Lumley, bookseller, Chancery-lane
D S—Apply to the Secretary to the Royal Academy of Music, Tenterden-street, Hanover-square
A SURGEON-DENTIST and ÆSCULAPIUS—For the Chloroform processes, see "Year-Book of Facts," 1850 and 1851
NO ARTIST, Dartmoor Prison—We shall be glad to receive the Sketch
S G M H—See the paper on Ornamental Poultry in the *Quarterly Review*, just published
POMPEIO—Cobbett wrote a brief History of England
L B W, Manchester—Wood-engraving tools may be had of Fenan, Newgate-street
G L—We do not interfere in card-playing disputes
A SUBSCRIBER, Cheltenham—Mr Paxton's Work on Flowers is an accredited one
A G K S—Sir E L Bulwer's "King Arthur," Part I., was published in 1848
A SUBSCRIBER FROM No. 1—See "Foster on Book-keeping"
GRATIS—The College of Preceptors is in Bloomsbury-square
M A B, Bury St. Edmunds, may purchase wax for flowers of Mrs. Strickland, Pantheon, Oxford-street
X Y, Portman square—See Allen's "Tour in the Mediterranean"
A SUBSCRIBER, Falmouth—Meerschaum, German for sea-froth, is a white earthy mineral, consisting of silica, 41·5; magnesia, 18·25; water and carbonic acid, 39. When first dug, it is soft and greasy
BLACKMORE—See "Dr. Gibney on Sea-Bathing"
F B, Killarney—Mr. Bentley, 8, New Burlington-street, is Publisher in Ordinary to her Majesty
W St. Swindon, is thanked; but we have not room for the Illustration
F R S—Apply for the work on the Artillery to Parker, Furnivall, and Co., Charing-cross
WASHINGTON, U S—Our April tools' custom is from the *possons d'Avril* of the French
V M C, Bow—Apply for the works on British Mosses and Algæ to Van Voorst, 1, Paternoster-row
A FRENCH SUBSCRIBER—Apply to J W Parker, publisher, 445, West Strand
QUERY—Mobarton is Hobart Town, the capital of Van Diemen's Land
AN EXHIBITOR should address his inquiry respecting California to the General Post-office
A CONSTANT READER, Glasgow—The public Restaurant Exhibition is now open
A SUBSCRIBER, Regent's Park—We cannot advise you
T N L, New York, will be entitled to the Large Prints, equally with subscribers "on the other side of the Ditch"
GEO—The coldest day in the year 1850 was January 15: its temperature was 15½ degrees. The mean temperature of May 31, 1850, was 60 degrees. The mean daily temperatures are published weekly in the Registrar-General's reports
JOHN O'GAUNT—At the death, unmarried, of her brother, but not before, the lady becomes an heiress; and her husband is then entitled to bear her arms on an escutcheon of pretence. An heiress in heraldry is a lady who has no brother, or whose brothers have died without issue. The position depends not at all on the inheritance of property
H C B refers GENEALOGIST to the evidences taken before a Parliamentary Committee preliminary to the present Registration Acts; and also to a work entitled "Observations on Marriages, Baptisms, and Burials, as preserved in Parochial Registers, &c., by Ralph Bigland. 1764"
ARMIGER may, with great propriety, adopt the coat of arms belonging to the family settled in the county whence his grandfather came. It is very difficult to prove a genealogical right to arms
G B L—The arms required are—"Quarterly ss. and arg. *Crest:* A tower arg. masoned ss. *Motto:* Une stay"
J H R S Y—Pudsey Dawson, Esq, is the present possessor of Hornby Castle, county Lancaster
H D, Athenæum—Ronconi is daily expected from Madrid. He will sing, in Auber's "Enfant Prodigue," the part of the father of *Azaël*, which will be sustained by Mario
T C E—Sacred works by his Royal Highness Prince Albert have been performed in London, and at the Birmingham Festival; but these compositions have not been published. We do not know the name mentioned by our Correspondent
BOSTON, HOMO—Your coins are worthless counters. Instead of being farthings of Queen Anne G W—Your coins are—Nos. 1 and 2, Denarii of Hadrian and Caracalla. Nos. 3 and 5, third brass of Carausius and Claudius Gothicus. No. 4 impression is too bad to be decipherred. No. 3 is rather a scarce type; but the others are common
A SUBSCRIBER—Hodnet was a London family. Its arms—"Arg. on a fesse az., between three bugle-horns sa. as many roses or. *Crest:* A buck trippant ppr." Thomas Jermyn, Esq. of Rushbrook, county of Suffolk, and Henry Jermyn, Earl of St. Albans, were sons of Sir Thomas Jermyn, of Rushbrooke, Treasurer of the Household to King Charles I
O P X—The wife of the chief of a clan has no right to the title of "Lady." Popular courtesy, however, often concedes it, as "the Lady of Clanranald," &c. A Knight's wife takes precedence
ADAMITES—The shield should be thus blazoned—1st and 4th, A.; 2nd, H.; and 3rd, B. A. marries the heiress of H., and H. brings in B.
I O T—The arms of Trotter are:—"Arg. a crescent gu. on a chief az., three mullets of the field. *Crest:* A horse trotting ppr."
QUERENS—All correctly pronounced except "Bayeux," which is pronounced nearly like "Buy-you"
A Z, Denbighshire—Some of the Ministry are, while in office, Poor-Law Commissioners. But the appointment of the paid and any other than a Ministerial Poor-Law Commissioner is by patent, during pleasure. Such appointment, therefore, may last for life; but we are not quite sure whether the paid Poor-Law Commissioner (the President) will or will not go out with the Ministry. At any rate, nothing in the Act creating his office requires him to do so
AIX-LA-CHAPELLE—We shall be glad to hear again from our correspondent. M J F

LIVERPOOL CHAMBER OF COMMERCE.—CUSTOMS REFORM.

Last week, at the quarterly meeting of this body, the chairman, Thomas Berry Horsfall, Esq., submitted for consideration a series of resolutions which had been drawn up on this subject by a committee of the Chamber, with a view to their forming the basis of their operations to obtain, through the medium of the Committee of the House of Commons on the Customs now sitting, a reform of the great abuses existing in the Custom-House system as at present administered.

The resolutions are as follow; viz.:—

"That, in the opinion of this council, it is very desirable that the Custom-House system should be re-modelled, and the following improvements be introduced:—

"1. That the head Board of Customs in London should consist of not exceeding five commissioners, in the appointment of whom regard should be had solely to their fitness for the duties of their office; that a portion of the board should be selected from persons of large practical commercial experience, and that one member of the board should sit in Parliament, in order to give answers and explanations to questions relating to this important department of the public business.

"2. That the collector, comptroller, and head inspector, at each of the chief ports, should form a board, with power to dispose of all cases of infraction of Customs regulations, or of disputed duties, arising within its jurisdiction, where the penalty or difference of duty may not exceed £100; but with the reserve of a right of appeal on the part of the public to the commissioners in London, and, if desired, from them to the Lords of the Treasury; and that increased discretionary powers should be committed to the local boards, for expediting and facilitating the Customs business of the port.

"3. That the privileges of 'special secured' warehouses should be extended to all warehouses (especially in Liverpool) when secured to the satisfaction of the local board, even though not surrounded by walls; and that deficits should in all ports be put on the same footing as in London, Bristol, and Dublin.

"4. That, in order to put an end to vexatious demands for duties on deficits arising out of obsolete bonds, a declaratory enactment should be passed entirely cancelling every import bond given previous to the 9th of July, 1842, the date of Sir R. Peel's new tariff act, which first formally perpetuated import bonds beyond the term provided by the Statute of Limitations, and interfered with the then existing cancelling clause, 3 and 4 Will. 4, cap. 52, sec. 123.

"5. That a return should be made to the triennial Bonding Plan; to effect which, all that is necessary is the withdrawal of the Treasury orders of the 17th of May, 1831, &c., which now suspend the whole warehousing code, framed on the triennial principle, and a repeal of 12 and 13 Vic, cap. 90, sec. 30, which on 1st August, 1849, enacted seven years instead of three as the term at the end of which the Customs could sell.

"6. That more explicit legal provisions be made in all bonds for cancelling the liabilities accruing under such bonds.

"7. That increased facilities should be granted to the transit of goods; to effect which, power should be given to the local boards to decide on the nature and extent of examination of goods necessary on application being made to them.

"8. That the working hours of the Customs out-door department should be considerably extended, especially in summer, and for duty-free goods; and that the privilege of working 'over hours' should be granted to all vessels on satisfactory application to the local board.

"9. That the practice of licensing vessels of a certain size to go beyond given distances from the coast be abolished, inasmuch as it is no longer applied to coasting vessels, the smaller craft, swift steamers, or foreign vessels of a like description.

"10. That parties suffering from confiscations, fines, or seizures by the Customs authorities, should have the right of inspecting the reports made by the informing or seizing officer; and that, in all cases where the Crown is defendant, an aggrieved party should be allowed as long a period within which he can sue, as is granted to the Crown when plaintiff. And that, with the view of preventing frivolous or vexatious proceedings on the part of the officers of the Customs in revenue cases, the Crown should be made liable for costs in all proceedings where the decision is against it.

"11. Numerous cases of hardships, inconvenience, and delay, arising out of the clashing of the Passenger Act and the Custom-house laws having occurred; also cases where the exercise of the jurisdiction of the civil tribunals (the Bankruptcy Courts, for instance) and the police regulations virtually compel innocent parties involuntarily to infringe the Custom-house laws: Resolved, that it is the opinion of this council that the attention of the committee of the House of Commons should be drawn to the same, with the view of providing a remedy.

"12. The council also considers that the present affords a fit opportunity of bringing under the notice of the Parliamentary committee the unconstitutional practice of making masters and employers responsible for the criminal acts of their servants, in smuggling, or other infraction of the Custom-house laws, though such acts can be proved to be beyond the control or cognizance of said masters or employers.

"13. That many of the forms and regulations at present in use at the Custom-house have become unnecessary in consequence of the recent changes in the tariff, and as they entail much inconvenience and delay on persons doing Custom-house business, the same should be abolished or simplified."

The Chairman observed, that, if these resolutions were brought before the committee of the House of Commons, as he could assure the Chamber they would be, he had no doubt that, as they had a right to do, the trading community on this subject would obtain redress. He would not occupy their attention by going further into this question than illustrating a point which really required no reform. They had now no export duties, and yet the same staff remained in operation as was considered necessary when these export duties were in force. He believed that, under the present regulations in Liverpool, a bill of entry had to pass through twelve or thirteen hands before it was available to the merchant; whereas, if there was a local board, he might have it almost immediately. After some further general observations, the chairman concluded by calling upon the secretary to read the report of the council.

The report detailed the general proceedings of the council during the past three months; and the business of the day concluded with the adoption of the following resolution:—"That, in the opinion of this meeting, the time is arrived when steps should be taken by the Liverpool Chamber of Commerce towards obtaining an improvement in the mode of adjudicating legally on cases of a commercial character."

THE ENGRAVINGS.

1.—ICE VASE. BY DODD.
2.—CLARET JUG. BY THE SAME.

Two very elegant specimens of silver work. The form of the ice vase is very graceful; and the ornamentation, though of a simple order, and all the better for being so, is of exquisite workmanship. The Claret Jug is decorated somewhat after the cinque-cento style, the principal subjects which surround it being emblematic of the four seasons.

3.—SPECIMEN OF COLOUR-PRINTING. ROWNEY AND CO.

This is one of many specimens of colour-printing from stone, exhibited by Messrs. Rowney, in the Fine Art Court, and referred to in our last. It represents the "Origin of the Guelph and Ghibellin'e Quarrel,' and is after a water-colour drawing by F. R. Pickersgill; lithographed in colour by R. P. Noble.

4.—GROUP OF VASES, &c. BY MANSARD.

We have here several specimens of stoneware vases and other vessels, after the classic models, by M. Mansard. These are productions of a genuine class, and are vastly superior as objects of decoration to the pigmy imitative statuettes at present so much in vogue. The large vase in the centre of the group is decorated with sacred subjects—the Saviour at the top, and the apostles beneath arches round the middle of it. It would be improved by a little more delicacy and harmony in the colouring.

5 & 6.—ZINC STATUETTES. FERNKORN.

These are two out of four figures of half life-size, designed by Fernkorn, and cast in zinc, at the Prince of Salm's foundry, at Vienna, which are exhibited in the Central West Avenue, around the entrance to the Dante window. They represent characters in the popular heroic poem, the "Niebelungen Lied," and are more interesting as illustrations of history and costume than as works of art, being, indeed, in the latter respect, coarse and unsatisfactory in the fullest extent of the terms.

7.—CENTRE-PIECE. BY LAMBERT AND RAWLINGS.

A very handsome production, in which the four quarters of the globe are represented as presenting their various contributions, whilst Britannia stands at the head welcoming all, with the palm-leaf in her hand.

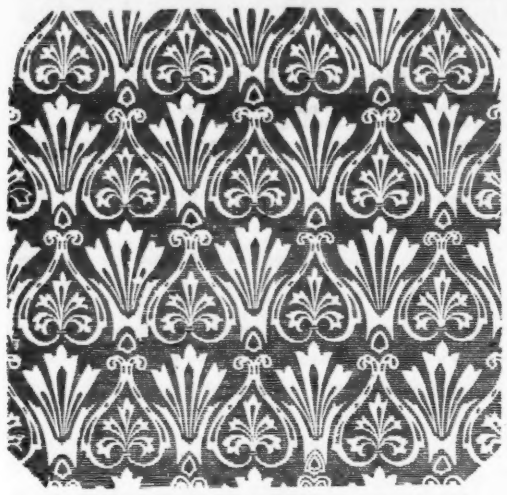
8.—GROUP OF GLASS. BY GREEN.

If there were any doubt of the wonderful progress made by us in the production of ornamental glass since the removal of the fiscal duties which formerly vexatiously interfered with it, the group of various objects exhibited by Mr. Green, and of which we have represented some in this Engraving, would alone be sufficient to remove it. It is unnecessary to go into minute detail of every object comprised in it; the fire-screen of glass and or, molu, however, for its extreme beauty, calls for particular remark. In the foliage in the other subjects, the same handsome material, or molu, is happily introduced. The glass portions exhibit every variety of treatment of which that beautiful and ductile material is susceptible.

9 & 10.—PAPER PATTERNS. BY TOWNSHEND, PARKER, AND CO.
Two very agreeable designs for paper-hangings.

11 & 12.—CANDELABRA. BY POTTS, OF BIRMINGHAM.
The reputation of Birmingham art is creditably sustained by these productions, in which simplicity of composition is happily combined with exquisite finish of workmanship. The stork candelabrum is especially beautiful.

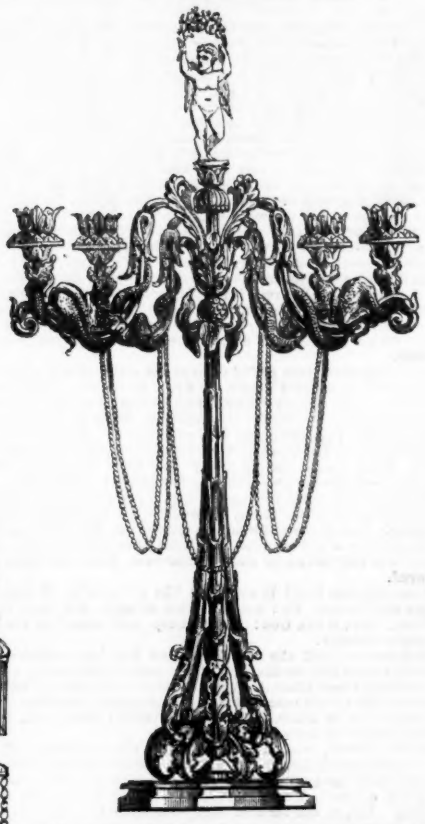
13.—CHANDELIER. BY PERRY.
All previous productions in this line are probably eclipsed by the magnificent crystal chandelier, manufactured by Mr. Perry, which is a conspicuous object in the gallery over the north-west corner of the Transept, in the immediate neighbourhood of the carpet worked for her Majesty by the hundred and fifty ladies whose names are recorded in connexion with it in the official Catalogue. This chandelier, which is a dozen or more feet in height, is intended for 144 candles: its design shows the style of glass-cutting of the eighteenth century, with the modern improvements. The colour and quality of the glass is no less remarkable than the massive elegance of the composition.



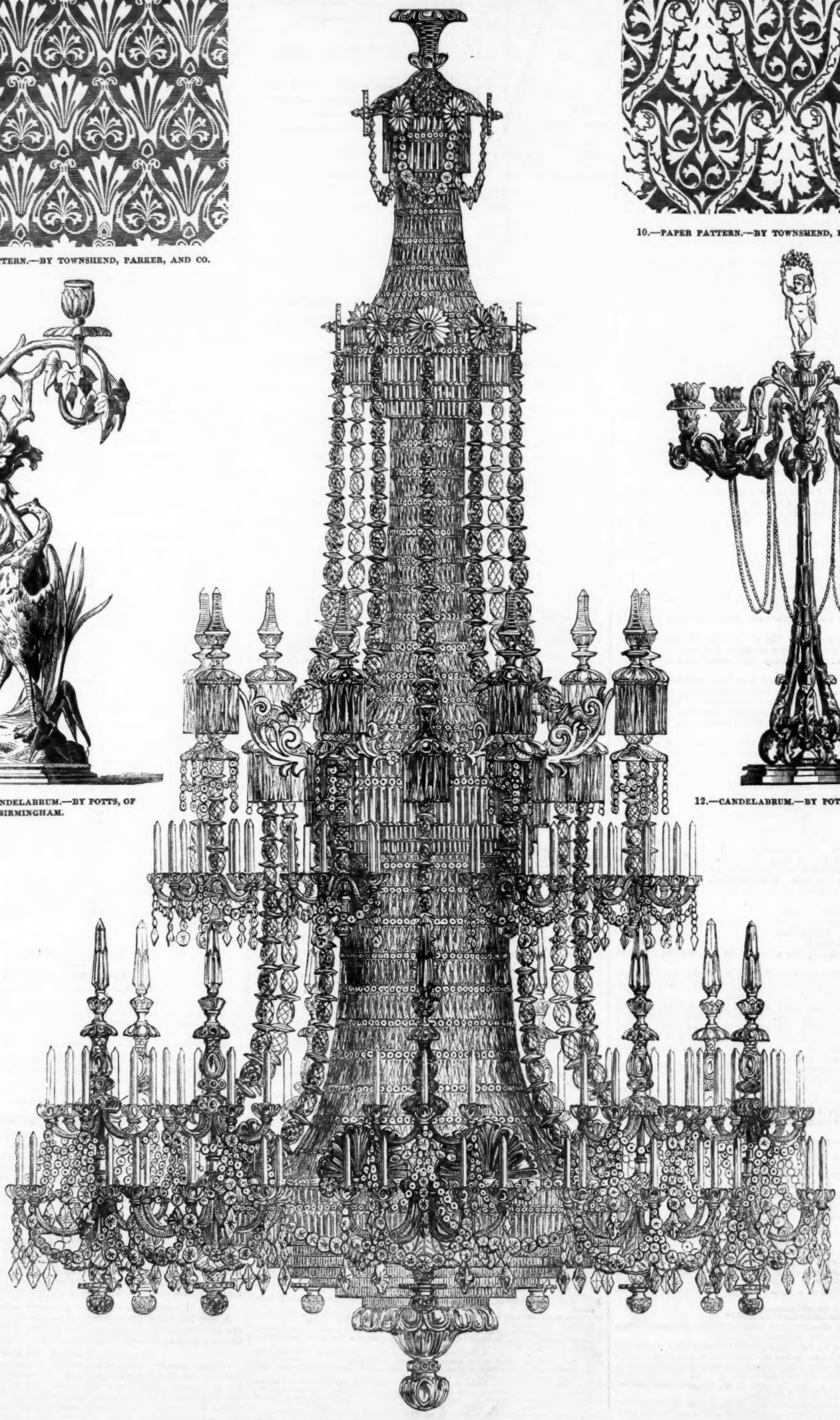
9.—PAPER PATTERN.—BY TOWNSHEND, PARKER, AND CO.

10.—PAPER PATTERN.—BY TOWNSHEND, PARKER, AND CO.

11.—STORK CANDELABRUM.—BY POTTS, OF BIRMINGHAM.



12.—CANDELABRUM.—BY POTTS, OF BIRMINGHAM.



13.—CHANDELIER.—BY PERRY, BOND-STREET.

London: Printed and Published at the Office, 198, Strand, in the Parish of St. Clement Danes, in the County of Middlesex, by WILLIAM LITTLE, of 198, Strand, aforesaid.—SATURDAY, JUNE 7, 1851.—SUPPLEMENT.